American Druggist

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ESTIMATION OF TANNIN IN TEAS, NUTGALLS, AND OTHER VEGETABLE SUBSTANCES.*

BY S. J. HINSDALE, OF FAYETTEVILLE, N. C.

DISSOLVE *one grain* of Potassic Ferricyanide in *sixteen fluidounces* of water, and add to it *twenty drops* of Liquor Ferri Chloridi.

Dissolve *one grain* of Tannin (gallo-tannic acid), dried at 212° F., in *thirty-two fluidounces* of water.

Exhaust with boiling water *ten grains* of powdered Tea, and make the infusion up to *sixteen fluidounces* with water.

Place eight wine-glasses on a white surface, in each of which place about 100 minims of the above iron solution.

With a pipette place in one of the glasses *five drops* of the filtered infusion of tea, and in the other glasses, *with the same pipette*, after washing, place 10, 11, 12, 13, 14, 15 and 16 drops of the solution of tannin and observe the shades of color. After about one minute fill the glasses with water.

The number of drops of the solution of tannin used in the glass which corresponds in *shade of color* with the glass containing the tea, indicates the percentage of tannin in the tea; thus, if 16 drops are used, the tea contains 16 per cent of tannin.

The tannin strength of galls can be estimated in the same way, making the infusion *ten grains* to the *pint* and *taking one* drop instead of *five* (as in the tea).

Each drop of the tannin solution used in *this* experiment will indicate *five per cent.* Thus, if 14 drops are used, the galls contain 70 per cent of tannin. As galls seldom contain less than 40 per cent of tannin, place 8, 9, 10, 11, 12, 13 and 14 drops of the solution of tannin in the glasses.

In estimating the strength of barks and substances containing less than 10 per cent of tannin, proceed in the same way as for tea, adding to the glass containing the infusion, drops enough of the tannin solution to make the shade of color correspond with that produced by ten drops of the tannin solution, and estimate accordingly.

The iron and tannin solution and the infusions must be freshly prepared.

* Read at the meeting of N. C. Pharmaceutical Association, at Goldsboro, Aug. 9th, 1888.

NOTES ON THE NATIONAL FORMULARY.

WE shall, from time to time, publish such criticisms and suggestions for improvement of this work as come to our knowledge and are deemed of sufficient practical value to be put on record.

114. *Emulsio Olei Morrhuæ.* Emulsion of Cod-Liver Oil.

Some of the reviewers very naturally ask the question why the "Stronger Emulsion of Cod-Liver Oil," which had been provided for by the New York and Brooklyn Formulary, was not introduced in the present work.

This matter was thoroughly discussed, and the arguments pro and con carefully considered. While on the one hand it is conceded that the keeping in stock of a strong emulsion, made in bulk, would be a great convenience for dispensing, yet the difficulty in keeping this for any length of time, and the consideration that a very large number of pharmacists would probably find it the reverse of economical to make any considerable quantity ahead, induced the committee to abandon the stock emulsion. Perhaps it might have been well to give a formula, in a foot note, so that those who desire to use it, and who have a chance of disposing of it before it can spoil, might refer to it. Yet the absence of this can do no harm, since any intelligent pharmacist will be able to devise a modification of the formula for this special purpose himself.

The *Druggists' Circular* makes the point that it would have been preferable to specify a definite and uniform flavoring in each formula of emulsions, rather than to leave the choice entirely free between seven different combinations. Of course, the meaning is that, while one special flavoring should be ordered in the formulæ, a list of other flavorings be given in a note. We believe this to be a good point and worthy of adoption in a future edition.

166. *Extractum Rhei Fluidum Aromaticum.* Aromatic Fluid Extract of Rhubarb.

In the note it should read: "If ½ fluidounce [instead of 1 fluidounce] of this preparation is mixed with 15½ fluidounces of syrup, the product will be practically identical with the officinal *Syrupus Rhei Aromaticus.*"

228. *Liquor Phosphori.* Solution of Phosphorus. Thompson's Solution of Phosphorus.

The *Chemist and Druggist* criticises the formula given for this preparation, as it is certain that the product cannot by any possibility retain ¼ grain of free phosphorus in a fluidrachm. The committee, having at least four different formulæ supplied to them by members and contributors, had recourse to Thompson's original work "On Free Phosphorus," and adopted his own formula, believing that, although it is not likely to contain the full amount of free phosphorus claimed for it, it yet had been long in use, and the therapeutic effects recorded to have been obtained by its use in medical literature are probably all, or at least largely, based upon a preparation made after Thompson's original directions. The *Chem. and Drugg.* points out that Mr. Williams had found glycerin to be an admirable substitute for alcohol as a solvent for phosphorus. In the proceedings of the Brit. Pharm. Conf. for 1874 (p. 588) will be found a paper by Mr. J. Williams in which he shows that a mixture of equal parts of absolute alcohol and glycerin dissolves phosphorus readily. The strength of the solution to be made, according to Mr. Williams, is between $\frac{1}{3\,6}$ and $\frac{1}{2\,4}$ grain per fluidounce. Warm glycerin alone, without alcohol, is also a good solvent of phosphorus, and the solution remains clear when it is diluted with alcohol.

225. *Liquor Morphinæ Hypodermicus.* Hypodermic Solution of Morphine. Magendie's Solution of Morphine.

The *Chemist and Druggist*, in its first notice of the "National Formulary," criticised this preparation on account of its title, claiming that the term "Magendie's Solution of Morphine" should rather be used as a synonym of No. 224, viz., "Liquor Morphinæ Citratis." In a subsequent number of the journal, however, the editor modifies his statement, in consequence of having received an interpellation from Mr. Martindale. From the editorial alluded to we quote the following:

The original formula of Magendie's solution of morphine appeared in 'Magendie's Formulary for the Preparation and Employment of Several New Remedies,'* of which at least eight editions were published, besides several English translations. The solution of citrate of morphine devised by Magendie was intended to replace a preparation with the same name introduced by Dr. Porter, of Bristol, U. S. A., which was made by treating 4 oz. of opium and 2 oz. of citric acid with a pint of boiling water, macerating twenty-four hours, and filtering. Magendie explains that Dr. Porter had formed the term *citrate of morphine* because he supposed that the preparation was composed entirely of citric acid combined with 'the alkali of opium,' and he points out that the preparation would contain 'morphine, narcotine, and all other crystallizable products recently discovered.' He then goes on to demonstrate the advantages of using pure morphine, and adds: 'The American physicians have used Porter's preparation with advantage . . . they regard this solution of citrate of morphine as more active than opium.' He then gives a formula for the solution of 'citrate of morphine.' But he also gives one for a solution of acetate of morphine, namely:

Acetate of Morphine	16 grains
Distilled Water	1 ounce
Acetic Acid	3 or 4 drops
Alcohol	1 gros [1 fl. drachm]

In France, Magendie's solution is at present prepared by dissolving 0.8 Gm. (12½ grains) of acetate of morphine in 30 Gm. (ab. 1 fl. oz.) of water. This is, therefore, much weaker than what is known in the United States as Magendie's solution. Martindale, in his Extra-Pharmacopœia, says that "Magendie's solution in France is slightly stronger than that of the United States; it contains 1 part of acetate of morphine in 37½." This is a mistake; the author should have said "somewhat weaker."

It is, however, to be noticed that the name of Magendie's solution has gradually come to be applied rather to a solution of a morphine salt of a particular *strength* than to the solution of any particular *salt* of morphine. In fact, solutions of acetate and of sulphate of morphine are indifferently known as Magendie's, provided they are of the established strength.

The editor of the *Chem. and Drugg.* acknowledges that there can be no doubt that in the United States Magendie's solution of morphine is understood to be made with the sulphate. He also states that in Europe it depends entirely upon the custom prevailing in different countries as to which morphine salt is to be used.

There can be no doubt that the selection of the sulphate would under all circumstances be preferable to the acetate or citrate, as the sulphate is an absolutely well-defined and stable salt, not requiring the addition of any acid to make a clear solution, nor liable to change by keeping. Perhaps a still better salt, considering therapeutics as well as pharmacy, would be the hydrobromide. But there is no use deviating from a long established custom.

* "Formulaire pour la préparation et l'emploie de plusieurs nouveaux médicamens," etc. 12mo, Paris, 1821 [1st edition].
English translations of 1st edition by Ch. T. Haden (London, 1823). Of 2d ed. by Robley Dunglison, London, 1824. Of 6th ed. by Jos. Houlton (London, 1828), etc., etc.—ED. AM. DRUGG.

235. *Liquor Sodii Boratis Compositus.* Compound Solution of Borate of Sodium. Dobell's Solution.

The *Pharm. Journ. and Trans.* remarks in reference to this formula that the solution, by the evolution of carbo nic acid, will often burst the bottles containing it. This is quite true, and a cautionary remark ought to have been added, to allow the reaction to proceed before stoppering the bottle.

278. *Pancreatinum.* Pancreatin.

Our attention has been called to an apparent contradiction in the notes to No. 278 and No. 318. In the former, a test is given for controlling the strength of pancreatin, and subsequently the following remark is made: "Peptonized milk, as prepared by the above process, or when the process is allowed to go on to the development of a very distinct bitter flavor, should not have an odor at all suggestive of rancidity. Milk has simply a marked bitter taste when thoroughly peptonized." And in No. 318, where a process is given for making peptonized milk fit for use, the remark is made: "Milk thus peptonized should not be used when it has been kept over twenty-four hours, or when it has developed a bitter taste."

In the note to No. 278, a test is given to ascertain the digestive or peptonizing value of pancreatin. There are many kinds of pancreatin, of varying strength, on the market. Some of them, though perhaps not the weakest, cause the development of a very decided and disagreeable rancid flavor in milk when the process of peptonization has been carried to a point when the milk has acquired a bitter taste. That is, when the milk is, for this very reason, unfit to be given as a food. The object here is only to ascertain whether the pancreatin is free from the objectionable, no doubt fatty, impurities which cause the production of the rancid flavor. In fact, the latter is only fully developed when the peptonizing process has gone beyond the limit at which the milk could be given as food.

In No. 318, it is already supposed that a pancreatin answering the requirements of No. 278 is at hand. Then a process is given to use it for peptonizing milk, which directions, if carefully followed, will result only in a *partial* peptonization, thereby avoiding the production of a bitter taste, which would render it unfit for use. And special directions are added that milk, peptonized according to the directions, should *not* be used when it has been kept over twenty-four hours, nor when it has been over-peptonized, that is, developed a bitter taste.

Incidentally, it may be remarked that the improvement of the process for preparing pancreatin, given in the list of errata, is quite important and should not be overlooked. It was brought to the notice of the committee after the text of page 818 had already been printed. The product obtained by the process must be freed from the last traces of *fat*, the presence of which not only interferes with its peptonizing power, but is also probably the cause of the rancidity developed in completely peptonized milk. The *Pharm. Journal*, in copying the process for No. 318, overlooked the correction.

308. *Pulvis Aloes et Canellæ.* Powder of Aloes and Canella. Hiera Picra.

Dr. Frederick Hoffmann, in the *Pharm. Rundschau*, states, although this compound powder bears the traditional name of Hiera Picra in this country, yet that this term has been in use for more than a century to designate a popular compound used for preparing an Elixir Vitæ ["Bitters"]. He gives a formula under the title *Species Hieræ Picræ*, Syn. *Species pro Elixirio ad longam vitam*, as follows:

Aloes, 8 oz.; Myrrh, 1 oz.; Benzoin, ¼ oz.; Rhubarb, Agaric, Ginger, Zedoary, each, 1 oz., Saffron, ⅛ oz.; Theriac, 1 oz.

We would here point out that the term Hiera Picra has been used by the old Greek physicians and mediæval writers to denote various bitter compounds, generally containing colocynth or aloes as a base, with addition of aromatics. Thus Galen (*De Comp. Medic. sec. locos*, lib. VIII.) mentions a hiera containing aloes 100 parts, and cinnamon, nardus, xylobalsamum, mastic, asarum, and saffron, each 6 parts. He advises the reduction of the aloes to 90 or 80 parts. Mesue describes 6, Haly Abbas 5, Myrepsus not less than 30 different kinds. These preparations then found their way into regular pharmacopœias, for instance, the Pharm. Augustana and many others subsequently. Gradually the formula was simplified, and that which is now known in England and the United States under this name is based upon the London Pharmacopœia of 1746.

353. *Syrupus Coffeæ.* Syrup of Coffee.

When the proofs and last revises were read, the title of this preparation was "Syrupus Caffeæ," it being overlooked by every one of the proof-readers that the botanical plant name of coffee is spelled *Coffea*, and not *Caffea*. Consequently the formula was left as No. 353, until it was too late to transfer it. But the error in vowels was corrected and the title changed to "Syrupus Coffeæ." It should, of course, properly have appeared after "Syrupus Cinnamomi," on page 126, the intervening preparations being advanced one number. But it seems that no one, so far, has been put to any inconvenience by the alphabetical misplacement.

401. *Tinctura Iodi Decolorata.* Decolorized Tincture of Iodine.

Perhaps it might have been useful to append a note to this preparation, to the effect that the extinction of color in a tincture or other preparation of free iodine implies that the iodine is no longer free, but in combination. But as all intelligent pharmacists at the present time will know this already, it was deemed unnecessary by the Committee to attach an explanatory note. Moreover, this preparation has long been known and used under the above name. It was officinal in the first German Pharmacopœia (1872), and is still so in the Russian and Swiss Pharmacopœias, under the same title.

Inks.

MR. EUGENE DIETERICH reports that he has obtained very remarkable results during his continued experiments on inks, particularly those made with nutgalls. He found that both the ferrous and the ferric tannate are soluble in an excess of tannic acid, and that ferric salts yield more stable inks than the ferrous salts heretofore usually employed. Moreover, when ferric salts are used, the employment of a mineral acid is not necessary to keep the tannate in solution, a little excess of gallic acid being amply sufficient. Inks thus prepared affect steel pens but little.

We append a few of the new formulæ published in the *Pharm. Centralhalle* (No. 27).

1. *Alizarin Ink.*

Indigotin	6 parts.
Pure Water	388 "
Sugar	20 "
Solution of Tersulphate of Iron (U. S.)	62 "
Ink Body (see below)	600 "

Dissolve the Indigotin by one day's maceration in the water. Then add the Sugar and Solution of Tersulphate of Iron, and lastly the Ink Body.

[The original has 400 parts of water and 50 of solution of tersulphate of iron, intending that of the Germ. Pharm. We have substituted an equivalent quantity of the preparation of the U. S. Ph., and diminished the water in proportion.—ED. AM. DR.]

In place of the ink body a solution of 60 parts of tannic acid in 540 of water may be used.

The prescribed method of mixing must be scrupulously followed.

The finished ink is set aside for eight days, and the clear liquid then decanted from the trifling precipitate.

This ink flows bluish-green from the pen, and writing executed with it on paper soon turns black. The writing may be copied inside of the first 48 hours.

The ink body above directed to be used is prepared in the following manner:

Macerate 200 parts of coarsely powdered Chinese galls for twenty-four hours with 750 parts of distilled water, strain and express. Upon the residue pour 350 parts of boiling distilled water and express after one hour. Triturate 50 parts of white bole with the mixed strained liquids, raise once to boiling, remove the scum, and filter through flannel bags. Wash the latter with water until the weight of the filtrate is 1,000 parts.

2. *Blue Document Ink.*

(Blue Nutgall Ink.)

Solution of Tersulphate of Iron (U. S. P.)	44 parts.
Sulphate of Sodium, cryst.	20 "
Sugar	20 "
Ink Body	500 "
Aniline-Blue (water-soluble) "I B"	4 "
Pure Water	q. s.

Dissolve the Sulphate of Sodium in 242 parts of Water, add the Solution of Tersulphate of Iron and the Sugar, and when the latter is dissolved, add the Ink Body. Lastly add the Aniline-Blue dissolved in 200 parts of Water.

In place of the ink body, a solution of 50 parts of tannic acid in 450 parts of water may be used.

Let the ink stand eight days, then pour off the clear liquid.

This ink writes with a fine blue color, dries rapidly upon paper, and after a few days becomes bluish-black.

Fresh writing made with this ink copies moderately well, but loses this property after a few hours.

For ordinary use, as for school purposes, this ink may be diluted with an equal volume of water which has been boiled and then allowed to become cold. For every 100 parts of the product, 3 more parts of sugar are added.

3. *Red Copying Ink.*

(Imperial Ink. Crown Ink. Coral Ink.)

Extract of Logwood, French, extra fine	100 parts.
Oxalate of Ammonium	30 "
Sulphate of Aluminium	30 "
Oxalic Acid	8 "
Bichromate of Potassium	5 "
Salicylic Acid	1 "
Pure Water	q. s.

Reduce the first four ingredients to a coarse powder and heat the mixture with 800 parts of Water to boiling in a copper vessel. Then add a solution of the Bichromate of Potassium in 150 parts of hot water, next add the

Salicylic Acid, and set the whole aside for fourteen days. Pour off the clear liquid, and fill it in ½-lb. or 1-lb. bottles.

In thin layers this ink has a fine red tint, and writes with violet-red color, which copies dark-violet, and also assumes the last-mentioned shade when drying. It is one of the best copying inks in existence. Writing done with it can be copied many weeks afterwards.

4. *Violet-Blue Copying Ink.*

(Japanese Ink. Cameroon Ink.)

Extract of Logwood, French, extra fine	60 parts
Oxalate of Ammonium	50 "
Sulphate of Aluminium	10 "
Sugar	10 "
Oxalic Acid	3 "
Bichromate of Potassium	6 "
Salicylic Acid	1 "
Pure Water	q. s.

Prepare this like No. 3, using the Water in the same proportions.

This ink is violet-blue in thin layers, flows dark-blue from the pen, dries bluish-black on paper, and yields bluish-black copies. As it is somewhat thicker than No. 3, it is preferable to use for it pens with broad nib.

5. *Ink for Writing upon Zinc and Tin (also Tinned Iron).*

Chlorate of Potassium	60 parts
Sulphate of Copper	120 "
Aniline-Blue, water-soluble, I B	1 part
Acetic Acid	100 parts
Pure Water	q. s.

Dissolve the Sulphate of Copper and Chlorate of Potassium in 1,400 parts of Water. Also dissolve the Aniline-Blue in 400 parts of Water and add the Acetic Acid. Then mix both solutions.

Upon *zinc* this ink is applied directly by writing with a steel pen. If writing, however, is to be done upon tin or tinned iron, this is to be first freed from fat or grease by ether and then to be rubbed over with a solution made from equal parts of chloride of zinc and hydrochloric acid. Of course, to write with this ink upon any surface, the latter must be thoroughly clean.

6. *Document-Ink Extract.*

Tannic Acid	50 parts
Tersulphate of Iron, dry	20 "
Sulphate of Sodium, dry	10 "
Sugar	20 "
Aniline-Blue, water-soluble, I B	4 "

Reduce them to a coarse powder and keep it in a tin box.

When using it, pour the contents of the box into an earthen jar, add 1 quart of pure hot water, and stir until everything is dissolved. When cold, the ink is transferred to bottles.

This ink writes with a bluish color and turns rapidly black.

[The dry tersulphate of iron, for the present purpose, is best prepared by evaporating 250 parts of Liquor Ferri Tersulphatis U. S. P. on a water-bath to a syrupy condition, then adding the dry sulphate of sodium, and transferring the mass, in thin layers, upon plates of glass, which are to be placed in a drying closet until the mass is dry, when it may be reduced to powder.—ED. AM. DRUGG.]

Artificial Mineral Waters.

WE have given several formulas for preparing the more commonly used mineral waters in our last issue. We now append a few more, partly for comparison, taken from the *Formulaire Pharmaceutique* of the Paris Hospitals (Paris, 1887):

1. *Contrexéville Water.*

Bicarbonate of Sodium	1 lb.
Sulphate of Sodium	3 "
Sulphate of Magnesium	3 "
Chloride of Sodium	1 "
Carbonic Acid Water	q. s.

to make 500 bottles or about 600 pints.

2. *Pullna Water.*

Sulphate of Magnesium	3 lb.
Sulphate of Sodium	3 "
Chloride of Sodium	1 "
Carbonic Acid Water	q. s.

to make 100 bottles.

3. *Seidlitz Water.*

Sulphate of Magnesium	9 lb.
Carbonic Acid Water	q. s.

to make 100 bottles.

4. *Sulphurous Water.*

Monosulphide of Sodium, cryst	390 gr.
Distilled Water	q. s.

to make 100 bottles.

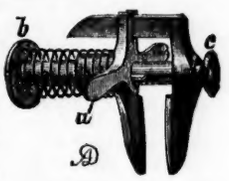
5. *Vichy Water.*

Bicarbonate of Sodium	6 lb.
Sulphate of Sodium	½ "
Sulphate of Magnesium	½ "
Chloride of Sodium	780 gr.
Carbonic Acid Water	q. s.

to make 500 bottles.

A NEW PINCH-COCK.

B. PROSKAUER has devised a new pinch-cock of universal applicability, which will shortly be patented. It combines the advantages of the screw and the clamp. Only one hand is required to regulate or adjust it, and this makes it especially valuable for use upon volumetric apparatus. It may be applied or removed at any time without disconnecting the ends of tubing, or without altering the adjustment of the jaws of the pinch-cock.

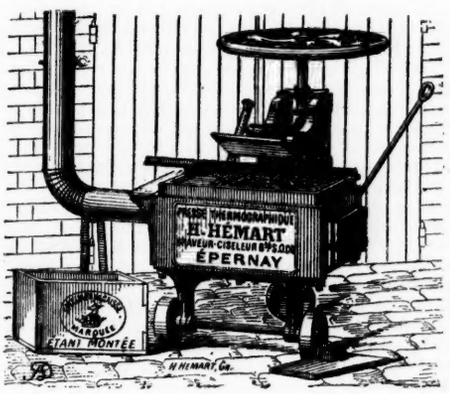


The construction of the pinch-cock is as follows (see cut). On turning the terminal screw *c*, the two jaws are either approached to, or separated from each other, the jaws always remaining parallel to each other. This screw motion is used only for regulating the distance permanently, if so desired, but the jaws may at any time be pushed further apart, by placing the thumb upon *b*, and the index and middle finger upon the two wings *a*, *a*. On pressing against the latter, the jaws will open, and on releasing the pressure, they will again return to the position at which they had been regulated by the screw *c*. When the pinch-cock is used for small rubber tubing, such as is usually attached to burettes, the two jaws are made to touch each other, by turning the screw *c* until this takes place. The pinch-cock is then regulated only by the three fingers of one hand, as described above.

These pinch-cocks are made in all sizes by Gust. Ludwig, Berlin, Fehrbellinerstrasse No. 14), and may be obtained through dealers in chemical apparatus.

BRANDING PRESS FOR BOXES.

IN a manufacturing and wholesale business it sometimes becomes desirable to stamp a trade-mark, address, or some particular device upon the cover or end-boards of packing boxes. A machine for accomplishing this, invented by H. Kernart, of Epernay, France, is shown in the adjoining figure. The design to be used is cast in metal, reversed as in the case of ordinary printing types and blocks, and is heated by being placed on a small portable stove which also forms the base of the press. By means



Branding press.

of a suitable compression plate, adjusted for the thickness of the boards to be branded, and actuated by suitable mechanism, the boards are firmly clamped against the face of the heated design, and the impression is both indented and charred into the face of the lumber. The entire apparatus is said to weigh about 800 lbs., and is capable of branding about 350 boxes or 400 boards per diem, and of giving an impression as handsome as if done by lithography, with the labor of a single person.

Kola.

AN article published in a German daily paper on the uses of kola has drawn a commentary from the well-known African traveller, Adolf Krause. Krause is of opinion that there is only a small demand for the drug in Europe, which is not likely to increase, as it would be difficult for a new nutrient beverage to command the field in the presence of such well-established rivals as cocoa, tea, and coffee. Only if it were very cheap would such a result be possible, and this condition he regards as unlikely, as the article is very highly esteemed by the natives—a statement which he supports by quoting various prices at which it is sold there. Krause also reminds readers that a German factory had made an attempt to introduce kola chocolate without satisfactory results. The opinion prevalent on the Continent that Europeans eat kola when in Africa is contradicted, it being asserted that they only do so when nothing else is to hand. The traveller says that he himself has tried it in all kinds of preparations, including the fresh drug, and the same when roasted like coffee, but he never derived any great pleasure or benefit from its use. [An interesting account on the Kola or Gûro nut, and its high value in the interior of Africa, will be found in our last volume, page 148.—ED. AM. DRUGG.]—*Chem. and Drug.*

On the Relative Value of Different Pepsin Tests.

FROM a lengthy paper on this subject, by Mr. James H. Stebbins, Jr., printed in the *Journ. of the Chem. Soc.* (March, 1888), we select those portions which appear to be of most practical value to our readers.

The author first mentions Bidder and Schmidt's method of testing which was directed to be carried out as follows: Place a known weight of small cubes of coagulated white of egg in contact with a liquid containing a known weight of pepsin dissolved in hydrochloric acid of 0.2 per cent strength, and heat the mixture for about five hours at 45° C. At the end of this time the undissolved albumen is washed and weighed. The loss in weight of this albumen indicates the digestive power of the pepsin.

This method of assay, says the author, has the inconvenience of taking into account only the amount of albumen dissolved, without paying attention to the amount of albumen really converted into peptone. The same objection also applies to the next two methods discussed by the author, one of which is the test of the U .S. Pharmacopœia, while the other is Manwaring's test.

Regarding the U. S. P. test, the author says that it is unreliable and misleading, as no two persons using the same pepsin can obtain the same, or even approximate results. [This is quite true, and is not even disputed by those who devised and introduced that test in the text of the U. S. P. But it should be remembered that in 1882, when the text of the U. S. P. was printed, our knowledge of the properties of pepsin and of methods of testing it were not as far advanced as they are now. Indeed, at that time, a better test could not be devised. At the present time, however, the case stands differently. While the digestive power of the officinal saccharated pepsin is not attempted to be interfered with, the National Formulary, recently published, contains an improved process of testing pepsin which is believed to be fully satisfactory. It also contains the feature, found fault with by Mr. Stebbins, that the digestive power is determined from the amount of undissolved albumen remaining behind. But, in our judgment, the most weighty objections (though not all) against this method are removed by the details of manipulation.—ED. AM. DR.] Several of the objections made by the author of the paper need not be mentioned here, as they are superseded by the new pepsin test just mentioned in the note in brackets. But there is *one* point which even now deserves attention. The writer says: "It is difficult to see how accurate results are to be obtained by weighing the amount of undissolved pepsin remaining after a digestion, because it is impossible to find two samples of coagulated albumen which contain exactly the same quantity of moisture; and besides this, the quantity of moisture is very liable to vary during the weighing, owing to the loss of moisture by evaporation." [The new test directs that egg-albumen prepared by boiling fresh eggs for 15 minutes shall be rubbed trough a clean hair sieve, having 30 meshes to the linear inch. This is a great improvement over the other method, but even here, there is no absolute certainty that the rate of hydration of the prepared mass is perfectly uniform. However, it is probably conceded that the error caused by this method is too small to be of practical importance.—ED. AM. DR.]

The author then turns to the "Manwaring test," which is given as follows:

"The design of the following mode of testing the dissolving power of pepsin is to conform as nearly as possible to the U. S. P. test, which, contemplating the testing of the saccharated form, makes no provision for the proportion of acidulated water to be used with a pure pepsin. On the basis that 1 part of a pure pepsin is capable of dissolving 1,000 times its weight of coagulated egg albumen in 6 hours, a saccharated pepsin made with a pure pepsin of U. S. P. strength would contain 5 per cent of pure pepsin. Therefore, if 1 grain of a U. S. P. saccharated pepsin is to be tested in the presence of 500 grains of acidulated water, then 1 grain of a pure pepsin should be tested in the presence of 10,000 grains of acidulated water to equal the same proportions of water and acid used for the *actual* quantity of pepsin contained in a U. S. P. saccharated pepsin when tested according to the U. S. P."

Manwaring recommends, when pure pepsin is to be tested, to mix it previously with milk-sugar. He also directs to rub the albumen (obtained by boiling eggs for 15 minutes) through a No. 30 sieve. [These and certain other features of the test in the National Formulary are based upon Manwaring's directions.] After digesting the pepsin and albumen for 6 hours at a temperature of 100–105° F., Manwaring directs to run up the temperature quickly to above 145° F., in order to destroy the pepsin. Then the bottle and contents are to be allowed to rest over night so that the undissolved albumen may settle. The strength of the pepsin is calculated by evaporating a small portion of the supernatant liquid to dryness, and by using certain factors for multiplying (which may here be omitted), the amount of normal albumen corresponding to the dry residue is ascertained. Mr. Stebbins raises several objections to this method, among which the following are the more important.

Regarding the direction that the peptic principle should be destroyed by raising the temperature up to and above 145° F., it is to be remarked that the object is not attained in this manner. It has been shown that digestion may and does continue up to 80° C. (172° F.), though of course much more slowly than at a lower temperature. Hence, if the bottle and contents are subjected only to a temperature of 62.2° C. (145° F.), and it is then set aside during a whole night, digestion will progress to some extent all night.

Another objection is raised against the method of determing the "peptone" contained in an aliquot part of the liquid, chiefly for the reason that the portion of liquid taken for the assay contains other substances besides true peptone. Mr. Stebbins confirms an observation long ago made by others, but which it is nevertheless worth while to mention again, viz., that the accumulation of peptone during peptic digestion hinders and finally stops the action of the pepsin upon the albuminoid matter entirely. If then the liquid is diluted, digestion will commence again, and proceed until the pepsin has become inert. Mr. Stebbins does not believe in the theory that one grain of pepsin can go on digesting to infinity.

The good points in Manwaring's test, according to Mr. Stebbins, are, first, that he directs strong pepsins to be suitably diluted before assaying them. Second, that he does not weigh the undissolved albumen, which is a great source of error. Instead of this, he calculates the amount of "albumen" digested from the amount of dry residue of a measured portion of the supernatant liquid. Mr. Stebbins thinks that, while the whole method contains errors, they are not as great as those affecting the U. S. P. method.

The author now turns to the test which he considers the only approach to accuracy so far proposed. He does not, however, regard even this as absolutely accurate, as slight errors are apt to occur, but he thinks that these do not materially injure the final result. The test here referred to is that proposed by Kremel, of Vienna.

In devising this test, Kremel has made a radical departure from the usual methods, and bases his test upon the fact that, under the conditions in which artificial peptic digestion takes place, pepsin alone has the property of converting albuminoid matter into peptone, and that, therefore, from an analytical as well as from a physiological standpoint, the only correct method is to take the quantity of peptone produced as a gauge of the action of the pepsin; or, in other words, the test is made to resemble as nearly as possible the conditions existing in the natural process.

Without going into any further detail, we shall give the test, as proposed by Kremel:

One Gm. of egg albumen (soluble) dried at 40° C. and pulverized, and 0.1 Gm. of the pepsin to be tested are placed into a 100 C.c. flask, and dissolved in 50 C.c. of 0.2 per cent hydrochloric acid. The solution is heated to 38–40° C. (100.4°–104° F.) for three hours, and then exactly neutralized with sodium carbonate; it is then heated on a water-bath to 90° C. (194° F.) and cooled, after coagulation has taken place. The flask is then filled to the mark with distilled water, 50 C.c. are filtered off and evaporated to dryness in a platinum dish on a water-bath.

The residue is dissolved in hot distilled water, filtered through a moist filter into a platinum dish, and the filter carefully washed. The solution is again evaporated to dryness and weighed. The peptone is then incinerated with ammonium carbonate, and the weight of the ash deducted leaves the weight of the pure peptone, or the representative of the digestive power of the pepsin.

The good features of the above test are the following:

1. Simplicity.

2. No guess work, troublesome calculations, or the use of questionable factors.

3. No weighing of albumen dissolved in hydrochloric acid, undigested albumen, and intermediary products along with the peptone. This is all obviated by the use of soluble egg albumen, coagulation and filtration, or removal of the undigested portion as detailed above.

4. The ease with which it is possible to duplicate and still obtain concordant results.

On the other hand, the objections to this process are the following:

1. The great difficulty of procuring absolutely pure soluble dried egg albumen. This source of error, however, in my opinion, is very slight, because in each test a large excess of albumen is always used, and consequently the pepsin always has enough albumen to act upon. Besides this, it must be remembered that only the peptone formed is weighed, and not the amount of undigested albumen, as is the case with the U. S. P. test.

2. It may be objected to this test that the results obtained are expressed by the weight of peptone formed and not by the weight of albumen dissolved, and consequently the figures, being based upon dry peptone, will be much lower than when the result is expressed as so much moist or coagulated albumen. If this, however, be objected to, it is comparatively easy to obtain higher figures by a simple calculation. Assuming that the amount of dry peptone obtained is equivalent to so much dry albumen, then by multiplying the weight of the latter by 8 (Manwaring's multiplier) we would obtain the equivalent in coagulated or moist albumen. Mr. Stebbins does not think it necessary or advisable to follow this course, as it involves the use of a multiplier which is questionable.

3. It takes a little longer to make a test by this process,

but if accuracy is thereby gained, the process is to be preferred.

The author now appends a series of analytical figures showing the result he obtained with this test. Fourteen samples of pepsin were tested, both "pure," and saccharated. The amount of peptone formed by 0.1 Gm. of the several samples within three hours varied from 0.5844 Gm. to 0.1738 Gm., and the author thinks that the figures obtained fairly indicate the relative strength of the several pepsins. As it might, however, be objected that the promiscuous application of this method to both "pure" and saccharated pepsins might do the former an injustice, by not bringing out their full digestive power, the author made a second series of experiments, in which he saccharated every one of the samples of "pure" pepsin he had previously assayed. The results obtained showed that the *relative* amount of pepsin formed was actually larger than when the undiluted pepsin were used in the experiment.

As all the results obtained by strictly following Kremel's directions are comparable among themselves, Mr. Stebbins does not see how the process can well be improved upon.

The mere fact that increased dilution increases the yield of peptone is not, in his opinion, sufficient reason for condemning the process. As the conditions prevailing in the stomach of a full-grown man do not differ materially as to dilution from day to day, it is safe to say that pepsins of varying strength administered to such a person will only perform a certain amount of work and no more, and that, consequently, the results obtained by this test more closely resemble the conditions prevailing inside the stomach than any other.

Adulterated Pepper.

At a recent meeting of the Paris Society of Pharmacy—according to the Paris correspondent of the *Chem. and Drugg.*—the fascinating subject of "Pepper Adulteration" was brought forward, and gave rise to quite an interesting exchange of views.

M. Ferrand said that at the previous meeting Prof. Planchon had somewhat criticised Gilet's iodine process, and markedly expressed his preference for the microscopical investigation. Yet, as a commercial test, Gilet's method is as reliable as it is convenient. One gramme of the pepper should be wetted with 80 centigrammes of tincture of iodine, made with 90 per cent alcohol, and allowed to dry without the addition of any water. Any ground olive-seed present (which is at present a very common adulterant) will at once turn to a uniform rhubarb-yellow, while pepper turns dark-brown. When a mixture of pepper and olive-seed is thus tested, as commercial pepper is never sold in the shape of an impalpable powder, the two substances present such a contrast in color as to be immediately apparent. The variegated aspect of yellow spots among brown cannot fail to attract attention. Indeed, from the samples shown by M. Ferrand, the test will do for all practical purposes.

A member having suggested that falsifiers will now add starch to their olive-seed powder, M. Ferrand replied it would not do, as commercial pepper is sold in coarse powder, and the olive-seed will show its yellow color with iodine. At the same time, microscopic examination must not be neglected, and cannot be replaced for general purposes. For olive-seed, however, Gilet's test is the thing, as no particular skill is needed, such as is required for handling a microscope. To some one's query: "How about the malaguetta seeds?" the reply was made that they are not used as adulterants proper, as they cost about as much as pepper. They are added, owing to their greater pungency, to permit the introduction of the real adulterating substances, and these must be looked for.

In the subject of pepper adulterations, Prof. Moissan related his experience when a young man employed in a wholesale drug-house. There the laurel leaves in which Italian licorice is packed being received in large quantities, were powdered, and the assistants ordered to mix some of the stuff with every parcel of powdered pepper sold. How were you to find this out?

M. Ferrand: "For the present, olive-seed, ground, is the common adulterant. It is a regular article of trade, sent out from Marseilles, sold in large quantities, properly ground, and offered of two colors, black and white, so as to better imitate the pepper color. The white is the olive-seed skilfully decorticated. The sophistication is not easily detected with a microscope, unless one is very expert indeed, while the iodine test is simple and convenient. It may be but a temporary expedient, as falsifiers will invent other frauds; yet for the present this settles ground olive-seeds."

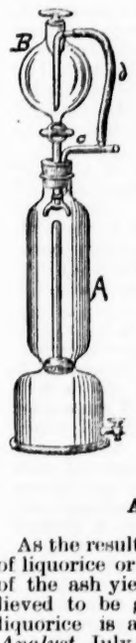
Colin spoke—while pepper sophistications were on the tapis—of roasted bread-crumbs as a general adulterant which had long puzzled him. It is likely to be added, it seems, to nearly everything, and is most difficult to identify. The only distinctive feature is the presence of the hair of the wheat, recognizable by experts. To give an idea of the ingenuity of falsifiers, he said, at the museum and other libraries their chemists are on the watch for new books on adulterations, and the first to read them.

AUTOMATIC DISTILLING APPARATUS.

The *British Trade Journal* recently described an automatic still especially intended for producing fresh water at sea, or in countries where good water for drinking or culinary purposes is not available. It is made by Brucher & Co., Wriscanton, Somerset, England, and may be had in either tinned plate or tinned copper, and is said to be comprratively inexpensive (prices not given) and very simple and efficient in its action. The water to be distilled is placed in the lowest receptacle or boiler, beneath which any convenient form of heating can be applied. Above this is the distilling or condensing chamber, fitted with a broad annular rim to catch the condensed vapor, and surmounted by a cone into which the steam from the boiler ascends, and where it is condensed by the lower temperature maintained in the cone by a supply of cold water flowing through the topmost compartment and circulating round this cone. These receptacles fit one into the other, and can be readily taken apart for packing and conveyance in a small space, and the cold water used for cooling can, with advantage, be made to flow into the boiler. Thus the whole becomes really automatic when once the supply is regulated. The distilled water is drawn from the bottom of the second chamber by means of a tube and nipple, and can thus be led to any receptacle prepared for it. It is made in two sizes, and would appear to be well adapted for pharmaceutical purposes.

A CONSTANT GAS GENERATOR.

A glass vessel, resembling a chloride of calcium drying cylinder (*A*) contains a perforated diaphragm and upright glass tube, which are attached, as shown in the cut, at the constricted portion of the cylinder. The neck is closed with a doubly perforated cork, carrying a drop-funnel *B*, provided with a stop-cock, to the exit of which is attached a spider-like glass jet, with capillary tubes, the object of which is to distribute the liquid (for instance, acid) uniformly over the material in the cylinder (for instance, calcium carbonate). Through the other perforation of the cork passes a gas-delivery tube, which is externally (at *c*) connected with the drop-funnel by means of a flexible tube *d*. By a proper adjustment of the stop-cock a very regular and steady current of gas may be produced. The spider-like liquid-distributor is illustrated in Figure 2. —After *Chem. Zeit.*



Adulterated Liquorice Juice.

As the result of the examination of a number of samples of liquorice or "Spanish juice," based upon a comparison of the ash yielded with that obtained from samples believed to be genuine, Mr. B. Dyer is of opinion that liquorice is adulterated to an enormous extent (*The Analyst*, July, 124). The sophisticated samples, so far as could be ascertained, appeared to be chiefly of French origin, the best samples coming from Italy. The genuine juices all contained a tolerably large quantity of starch, but this was readily distinguishable from the added starch, which was recognized in different samples as derived from wheat, barley, rice, potatoes, and perhaps rye. The samples in which adulteration are detected by the microscope showed a very low yield of ash free from silica and clay; in four cases the quantity fell below 2 per cent, and in another case below 3 per cent, whilst that from presumably genuine specimens ranged between 3 and 5 per cent. Another difference observed was in the relative proportion of potash in the ash, which in that from genuine samples amounted to from 34 to 43 per cent, whilst in that from adulterated samples it was only 18 to 30 per cent. A sample made by Mr. Dyer, by evaporating a decoction of liquorice root, gave results that agreed well, as regards the quantity of ash and its composition, with those obtained from the commercial samples of reputed genuineness, except that the proportion of phosphoric acid in the former was much higher.—After *Pharm. Journ.*

Official Tests for Arsenic and Tin, in Germany.

A GOVERNMENT order, made for carrying out the details of a law regarding the use of noxious ingredients in articles of food or use, has recently been issued in Berlin, which prescribes very minutely the methods to be followed in testing for *arsenic* and *tin*. As this method has evidently been most carefully drawn up, and embodies all improvements that have been found acceptable up to the present time, it will be of interest to place on record here at least that portion of it which refers to *arsenic*. It should be stated that the law particularly aims at the suppression of poisonous colors for articles of food or general use.

I. SOLID SUBSTANCES.

1. Of solid articles which are dyed throughout, 20 grammes are taken in operation. If the color is only superficial, it is scraped off, and such a quantity of it used that it corresponds to 20 grammes of the original substance. Only when the prescribed amount of 20 grammes cannot be obtained, may a smaller quantity be used for the test.

2. Reduce the sample by trituration, or in any other manner, to a fine powder or mass, and then mix it, in a capsule of genuine porcelain [Berlin porcelain], with a measured quantity of pure hydrochloric acid, spec. gr. 1.100 to 1.120, mixed with so much water that the proportion of the hydrochloric acid to the water is about like 1 to 3. Usually, 25 C.c. of the above-mentioned hydrochloric acid and 75 C.c. of water will answer the purpose.

Next add 0.5 Gm. of chlorate of potassium, transfer the capsule to a water bath, and, as soon as the contents have acquired the temperature of the latter, add, in intervals of five minutes, further small portions of the chlorate, until the liquid has acquired a light-yellow color, and has become homogeneous and thin fluid. About 2 Gm. of the salt, altogether, will usually be found sufficient. The water which is lost by evaporation must be replaced from time to time. When the desired point has been attained, 0.5 Gm. more of the chlorate are added, and the capsule removed from the water-bath. When it has become completely cold, the contents are passed through a filter placed over a flask of the capacity of about 400 C.c. When all the liquid has passed, the flask is placed on the water-bath and heated until the odor of chlorine has nearly disappeared. The filter and residue, which it usually contains, are well washed with hot water, the wash-water evaporated on the water-bath to about 50 C.c. and this portion, together with any precipitate that might possibly have separated, added to the filtered liquid in the flask. Care is to be taken that the total volume of liquid be at least six times that of the volume of the hydrochloric acid employed. For instance, if 25 C.c. of hydrochloric acid were originally used, the final liquid (filtrate and concentrated washings) must measure at least 150 C.c., but are preferably 200 to 250 C.c.

The liquid is now heated to between 60° and 80° C. (140° to 176° F.), and while being kept at this temperature, a slow current of pure, washed hydrosulphuric acid gas is conducted through it during three hours. It is then allowed to cool, the current of gas being continuously maintained, the flask then lightly covered with a piece of filtering-paper, and set aside in a moderately warm place, for at least twelve hours.

4. If a precipitate has been produced, this is to be collected upon a filter, washed with water containing hydrosulphuric acid, and, while still moist, to be treated with moderately yellow sulphide of ammonium which had previously been diluted with dilute water of ammonia. Usually, 4 C.c. of sulphide of ammonium, 2 C.c. of water of ammonia (sp. gr. 0.960), and 15 C.c. of water, will suffice. Any residue remaining after the treatment with sulphide of ammonium is washed with water containing sulphide of ammonium, and the filtrate and washings evaporated to dryness, in a deep porcelain capsule of about 6 Cm. diameter, at a moderate heat. The residue left upon evaporation is covered with about 3 C.c. of crude, fuming nitric acid—the capsule being covered with a watch-glass—and the acid then cautiously evaporated at a moderate heat. If the residue which now remains has a yellow color, while yet moist, it is treated as directed in the next paragraph. But if the residue is dark-colored, it must be again treated with crude, fuming nitric acid, until it looks yellow while moist.

5. The yellow and still moist residue in the capsule is mixed with finely-powdered sodium carbonate until the mass has a strongly alkaline reaction, then further mixed with 2 Gm. of a mixture of 3 parts of carbonate and 1 part of nitrate of sodium, a little water being added so as to produce a homogeneous, pulpy mass. This is dried in the capsule, and cautiously heated until it is anhydrous or begins to melt. A higher temperature should be avoided. The resulting mass will be white or colorless. Should this not be the case, a little more nitrate of sodium is to be added, until the desired result is attained.*

6. The melted mass is treated with water, at a gentle heat, and the liquid passed through a filter. If any *tin* was present, this is now (almost all) contained in the residue upon the filter, in the form of white *oxide of tin*, while the *arsenic* is contained in the filtrate as *arsenate of sodium*. If a residue has remained on the filter at all, it is to be remembered that a small portion of the tin may also be contained in the filtrate. The residue is once again washed with cold water, then three times in succession with a mixture of equal parts of water and alcohol, and the washings evaporated, so that the united filtrate and washings amount to about 10 C.c. Next, diluted nitric acid is added, until the liquid just has an acid reaction. Should this produce a separation of traces of oxide of tin, this is filtered out and washed again as directed above. The filters now containing any *tin* that may have been present are then specially treated so as to isolate and determine the quantity of this metal. (The prescribed process contains nothing new and is here omitted.)

7. To demonstrate the presence of arsenic (in the filtrate), it is first converted into arsenico-molybdate of ammonium. For this purpose, the liquid is acidulated with nitric acid, freed from carbonic and nitrous acids by warming, then cooled, and, if necessary, again filtered. It may now amount to about 15 C.c. It is now mixed, in a small flask, with about an equal volume of a solution of molybdate of ammonium in nitric acid,* and allowed to stand three hours without warming. Should the liquid, owing to an insufficient washing of the first hydrosulphuric acid precipitate, contain traces of phosphoric acid, this would be now precipitated as phospho-molybdate of ammonium. If the operation, however, has been carefully conducted, no precipitate [certainly none containing any arsenic] will form.

8. The clear or filtered liquid (of § 7) is now warmed on a water-bath, until it has been kept at the temperature of the latter for about 5 minutes (or better, until molybdic acid begins to separate). If any arsenic was present, this will be separated as a yellow precipitate of arsenico-molybdate of ammonium, and there will usually be also a separation of white molybdic acid. After standing one hour, the liquid is passed through a small filter, which will retain a trace of the precipitate, while the largest part of the latter will remain in the flask. The precipitate in the flask is now twice washed with a mixture of 100 parts of the above-mentioned (see note) molybdic reagent, 20 parts of nitric acid (sp. gr. 1.200) and 80 parts of water, and then dissolved, by warming, in 2 to 4 C.c. of water of ammonia (sp. gr. 0.960), with subsequent addition of 4 C.c. of water. If necessary, the liquid is again passed through the small filter [if any of the precipitate had first been collected upon the filter, it should be treated in the same manner as that contained in the flask, so as to get it all into one solution. —ED. AM. DRUGG.], and the filtrate mixed, first with one-fourth of its volume of alcohol and then with 2 drops of solution of chloride of magnesium and chloride of ammonium. [The analytical, so-called magnesia mixture made with sulphate of magnesium will also answer.—ED. AM. DR.] The arsenic will separate, either at once, or on standing in a cold place, as white and more or less crystalline ammonio-magnesium arsenate. This is filtered off and washed with the least possible quantity of a mixture of 1 part of water of ammonia (0.960), 2 parts of water, and 1 part of alcohol.

9. The washed precipitate on the filter is next dissolved in the least possible quantity of dilute nitric acid, the solution evaporated to a small bulk, then one drop transferred upon a porcelain disk, and another upon an object glass. To the drop on the disk is added a drop of solution of nitrate of silver, and afterwards, from the edge, a drop of water of ammonia (0.960). If arsenic was present, a reddish-brown stripe will be formed at the line of contact, due to the formation of arsenate of silver. The drop placed upon the object glass is rendered alkaline with the least possible quantity of water of ammonia. If arsenic is present, there will be produced, either at once or after a short time, a precipitate of ammonio-magnesium arsenate which, when viewed under the microscope, will be seen to consist of pointed crystals.

II. LIQUIDS, JELLIES, ETC.

Of liquids, etc., the quantity to be taken is such that it corresponds to about 20 Gm. of dry substance. For instance, of strawberry syrup about 30 Gm., of red wine or vinegar about 800 to 1,000 Gm. In exceptional cases, when these quantities are not available, smaller amounts may be used.

Fruit-juices, jellies, etc., are treated with hydrochloric acid and chlorate of potassium precisely as directed under I. Thin liquids, not of an acid reaction, are evaporated to a small bulk, and this treated like jellies, etc. Thin, acid liquids are distilled until only a small residue remains, and this is then treated as directed before. The distillate, in this case, is acidulated with hydrochloric acid, and likewise treated with hydrosulphuric acid in the same manner as the solution of the residue.

III. IN WOVEN FABRICS, ETC.

If the arsenical dye or color is soluble in water, it may be extracted by this liquid. Usually it will probably be

* If the melted mass remains black, in spite of this treatment, this is usually due to a small amount of copper, since sulphide of copper is not entirely insoluble in sulphide of ammonium.

* Dissolve 1 part of molybdic acid in 4 parts of water of ammonia (sp. gr. about 0.960), and pour the solution into 15 parts of nitric acid (sp. gr. 1.200). Let the mixture stand a few days in a moderately warm place, and, if necessary, draw it off clear from any sediment formed.

but little or not at all soluble. In all cases it is convenient to test a small portion in Marsh's apparatus in order to ascertain whether arsenic *is* present or not. If none is thus discovered, no further tests are required.

Take 10 Gm. of the fabric, cut it into small pieces, introduce these into a tubulated retort of potash-glass, of the capacity of about 400 C.c. and add 100 C.c. of pure hydrochloric acid of spec. gr. 1.190. The neck of the retort should be drawn out and bent at an obtuse angle. The retort is adjusted so that the branch extending from the retort itself is directed obliquely upwards, and the second bent downwards. The latter is introduced into a Liebig's condenser, the connection being closed by a piece of rubber-tubing. The condenser tube is made to dip air-tight into a tubulated receiver of about 500 C.c. capacity, containing 200 C.c. of water. To keep it cool, it is placed into a basin containing cold water. The tubulure of the retort is connected with a Peligot tube filled with water (to form a water-joint). After about one hour, 5 C.c. of a cold saturated aqueous solution of crystallized ferrous chloride (free from arsenic) is put in the retort and the contents heated. When the excess of hydrochloric acid has been driven off, the temperature is raised so as to bring the contents to boiling, and the distillation is continued until the contents begin to swell. The retort is allowed to cool, 50 C.c. more of hydrochloric acid (sp. gr. 1.190) then added, and the distillation repeated.

The distillate in the receiver (which may have a brown color from organic matter), united with the contents of the Peligot tube, is put into a flask, diluted to 600 or 700 C.c. with distilled water, and a current of pure hydrosulphuric acid gas then conducted through it, first while heating, and afterwards during cooling.

After 12 hours, the brown precipitate (partly or entirely consisting of organic substances) is filtered out upon an asbestos filter, prepared by a suitable layer of asbestos in a funnel, the exit tube of which contains a glass stop-cock. After washing the filter a short time, the stop-cock is closed, and the residue upon the filter—while the funnel is covered with a plate of glass or watch glass—treated with a few cubic centimeters of bromated hydrochloric acid (prepared by saturating hydrochloric acid of sp. gr. 1.190 with bromine). After about half an hour's treatment, the solution is allowed to flow off through the stop-cock into the same flask in which the precipitation was carried out, upon the walls of which there are frequently slight films of the original sulphuretted precipitate. The residue upon the asbestos filter is washed with hydrochloric acid of spec. grav. 1.190.

The liquid in the flask is again mixed with an excess of ferrous chloride and transferred (with washings made with hydrochloric acid of sp. gr. 1.190) into a smaller retort, where the distillation is conducted precisely as described before.

The distillate will now usually be limpid like water. It is then diluted with distilled water to about 700 C.c. and treated with hydrosulphuric acid as directed above. After 12 hours, any precipitated sulphide of arsenic is separated by filtration upon a filter which had previously been washed successively with dilute hydrochloric acid, water, and alcohol, then had been dried at 110° C. and weighed. The residue upon the filter is washed, first with water, then with absolute alcohol, afterwards with warmed disulphide of carbon, and lastly again with absolute alcohol. It is then dried at 110° C. and weighed.

From the amount of As_2S_3, the quantity of arsenic originally present is calculated. In the case of fabrics (or wall papers) the calculation should extend to the amount present in a given square surface, best in 100 square centimeters.—After *Zeitsch. f. Anal. Chem.*, 1888, 471–478.

Color-Test for Saccharin.

Mr. David Lindo writes in the *Chem. News* (August 3d):

I have failed as yet to obtain a characteristic reaction [color-reaction] for the substance in solution. The following test, which must be applied to the solid body, is believed to be original. It consists in evaporating to dryness on the water-bath the saccharin mixed with excess of nitric acid. A fragment of caustic potash (not too small) is then added, and a drop or two of water, without removing the dish from the bath. Color is at once developed, and if the dish is inclined, streaks of color, blue, violet, purple and red, flow from the caustic. The reaction is very fine, and still more beautiful if fifty per cent alcohol is added to the potash instead of pure water. The test, however, is not extremely delicate: half a milligramme of saccharin in the solid state is about the smallest quantity that will give definite results. Heat is necessary to develop the colors, and apparently a large excess of alkali. Soda does not appear to act as well as potash. Mr. Lindo adds that color reactions obtained with coal-tar products must always be suspected of not being characteristic. Whether the one here described for saccharin is peculiar to it, remains to be ascertained.

The Indiana Legislature has enacted a law prohibiting the refilling, more than once, of prescriptions containing doses of more than ¼ grain of opium or $\frac{1}{20}$ grain of morphine without verbal or written order from the prescriber.

AN IMPROVED FILTERING APPARATUS.

P. Raikow has utilized Nickel's idea of perforated filters in a new manner.

A conical tube of porcelain (*D*), which is perforated with a series of holes, is placed inside of a funnel, in the manner shown in the cut, the portions coming in contact being suitably ground. The cone *D* is wound around with filtering paper, cut into strips of 2 to 4 Cm. width, which may be suitably tied. The liquid to be filtered is poured into the space between the funnel and conical tube. If there is much sediment, the lower holes of the filtering tube will gradually become clogged, but the upper ones will still continue to functionate.

In case it is desired to hasten filtration by a filter pump, the orifice of the cone *D* is closed with a cork carrying a tube which is connected with the pump. In this case, of course, care must be taken that the level of the liquid to be filtered is maintained above the top row of holes in the cone; otherwise air would be aspirated, and the action of the pump be neutralized. When the liquid becomes scant in quantity, the author recommends to push a cork (which is supposed to fit suitably, see Fig. 2) down the conical tube, so as to cover the several rows of holes which would otherwise be exposed.—After *Chem. Zeit.*

Fig 2.

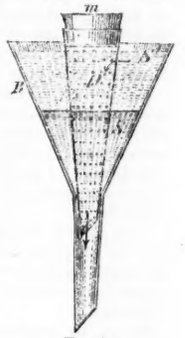


Fig. 1.

Note by Ed. Am. Drug.—In place of this arrangement, we would construct the apparatus differently. We would use not a conical, but a parallel-sided tube with rows of holes, and fasten it by passing it through a cork put into the neck of the funnel in such a manner that the connection would be water-tight, but at the same time permit the tube being pushed down through the cork when so desired. After the last of the liquid has been poured into the space between the funnel and central tube, the level of the liquid must be watched, and whenever it approaches the top row of holes, the tube must be pushed down so as not to permit any access of air.

ON FILTRATION.

Otto Hehner and Henry D. Richmond have examined the methods for inserting filters in funnels, in order to find out which is the best. If a filter is so placed in a funnel that it is at all points in contact with the latter, the liquid cannot escape, and filtration is slow. For this reason, corrugated or channellated funnels have been made, which do not, however, any longer fulfil their purpose, owing to the thin filtering paper now generally used, which stretches sufficiently to accommodate itself to the uneven surface of the funnel. The authors caused funnels to be made which contained four ridges upon their inner surface, the ridges running from the rim to the neck. Then they examined the rate of filtration through different kinds of funnels and with differently folded filters. As filtering liquid, 250 C.c. of pure water were used, and the filters kept constantly full. For each experiment a new filter was used, since even pure water gradually stops up the pores of a filter, thereby retarding filtration. The results, which express the rate of filtration of 250 C.c. of pure water in *seconds* of time are given below. A variety of filtering papers were used by the author, but we shall note here only the reference made to Schleicher and Schuell's papers.

	250 C.c. of water filtered in .... seconds.					
	2	3	4	5	6	7
Schleicher and Schüll's filtering paper.	563	840	160	—	98	120
	450	160	145	—	100	200
	545	180	192	—	90	155
	750	250	162	—	188	150
Mean	577	357	165	—	119	156

Column 2 gives the rapidity of filtration (in seconds) with smooth funnel; No. 3 the same, with smooth funnel and closely cut-off stem, the paper being folded at an angle somewhat larger than 90°, so that it may not fit tight; No. 4 the same arrangement, only with substitution of the new funnel above-mentioned; No. 6, with folded filter; and No. 7 with the filter folded, as shown in the cut. This is done in the following manner: Fold the filter in the direction of two diameters crossing each other at right angles. This will produce four quadrants. Open the filter out again, reverse it, and in two opposite quadrants fold back the edges until they meet. When the filter is placed in a funnel of 60°, it will exactly fit it.—After *The Analyst.*

The Synthesis of Coniine.

In 1886, Prof. Ladenburg announced the important fact that he had succeeded in producing synthetically the alkaloid coniine possessed of every property which characterized the natural alkaloid. Previous to that time, a synthetical coniine had already been prepared, but while this corresponded with the natural alkaloid in nearly every respect, yet there were some differences which showed that the identity was not absolute. One of the chief differences was this, that the artificial coniine was optically inert, while the natural coniine turned polarized light to the right.

It has long been known that artificially prepared organic bases are optically inert, while all natural alkaloids turn the ray of polarized light either to the right or to the left. The solution of this puzzle will no doubt mark an important era in chemical knowledge, and an important step towards its solution has been made, first, by Pasteur in his researches upon dextro- and lævo-tartaric acids, and now by Ladenburg. The latter has occasion, in a recent extensive paper on pyridine and piperidine bases, published in *Liebig's Annalen* (vol. 247, p. 80), to give a more detailed account of how the synthesis of "natural" coniine was brought about, and we give the more interesting portions of this paper in the following:

Although coniine was observed already in 1827 by Gieseke and shortly afterwards more closely studied by Geiger, its correct chemical composition ($C_8H_{17}N$) was first determined by Hofmann in 1881. The latter recognized its similarity to piperidine, and subsequently showed that it could be changed, by a reduction process, to a new base, $C_8H_{11}N$.

The latter, known as conyrine, has been recognized by its decomposition products to be identical with propyl-pyridine, which may in fact be obtained by the action of reducing agents (nascent hydrogen, etc.) upon natural coniine.

Without entering here too minutely into the chemical constitution and relationship of the several synthetic compounds involved in the final building up of true coniine, we will merely state here that the next problem to be solved was the conversion of alpha-propyl-pyridine, (or conyrine ($C_8H_{11}N$) into alpha-propyl-piperidine which latter contains six atoms more of hydrogen, and is, therefore, according to its elementary composition, apparently identical with natural coniine: $C_8H_{17}N$. It was not necessary to convert the first-named base itself into the second, as there were better means available to pass from the pyridine series to that of piperidine. Alpha-allyl-pyridine was treated with metallic sodium and boiling alcohol, and produced the desired base in nearly theoretical quantity. The crude base was converted into the hydrochlorate, the latter several times recrystallized, and the base isolated by distilling the salt in the usual manner with aqueous solution of soda. The oily alkaloid was separated from the distillate, the remainder dissolved in the condensed water, separated by potassa, and the united portions of the alkaloid then dried over potash.

The base thus obtained coincided in boiling point, elementary composition, odor, specific gravity, behavior towards reagents, physiological effects, etc., etc., completely with natural coniine, *but there was still a difference*, as the artificial base was optically inert, while natural coniine is dextrogyre.

The important step now to be undertaken was to split the optically inactive artificial coniine into its two component isomeric bodies, which—after the analogy of certain substances investigated by Pasteur—could be anticipated to be, the one dextrogyre and the other lævogyre, in such proportions that their optical properties mutually neutralized each other. Pasteur had shown that *uvic acid* is such a compound, made up of dextro- and lævo-tartaric acid.

Ladenburg tried several methods to bring about a splitting up of the artificial coniine. One of these consisted in treating a solution of the base with fungi, which could be expected to destroy one of the active isomers, leaving the other behind. [Pasteur had shown, in 1860, that if to a solution of acid uvate of ammonium, containing traces of phosphate, some spores of Penicillium glaucum are added, the dextro-tartaric acid, of which the uvic acid is partly composed, is gradually consumed, so that lævo-tartaric acid finally alone remains.] But it was found that coniine behaved, even towards the most resisting fungus (Penicillium glaucum) so poisonous that no solutions containing over 0.1 per cent could be employed. And even after many weeks' trial, the coniine was found to have undergone no change.

The next method was one for which Ladenburg made use of a hint afforded by Pasteur's investigations. Remembering that this chemist succeeded in splitting up *uvic acid*, while the latter was combined in *salts*, Ladenburg looked about for an optically active acid which would form a well-crystallizable salt with coniine. A good promise appeared to be afforded by the dextrogyre tartrate of coniine, which had been prepared some years previously by Schorm. This was a salt of coniine prepared with dextro-tartaric acid. On preparing a syrupy solution of equal molecules of tartaric acid and true *coniine*, and adding to it a crystalline fragment of the before-mentioned salt, Ladenburg found, after a short time, that the whole liquid solidified to a *hard crystalline mass*. On repeating this experiment with substitution of alpha-propyl-piperidine, that is, artificial coniine, crystals appear in this liquid likewise, but even after eight days it was only *partially* solidified. As it could not be filtered, the mass was transferred upon blotting paper, which absorbed the syrupy portion. The crystals were freed from adhering syrup by strong pressure between bibulous paper, the dry crystals decomposed by potassa, the base distilled over, and after being separated and dried examined in the polariscope. It was now found to turn the plane of polarized light to the right to the same (or practically the same) degree as natural coniine, and in all other respects, even where there had previously yet been some slight differences, the identity was absolute.

Hence this operation resulted for the first time in the complete synthesis of a natural alkaloid—if we understand under alkaloids those natural bases of vegetable origin which are related to pyridine, or at least contain a nitrogenized nucleus.

In this connection, it is proper to remark that not only Ladenburg, but many other chemists had heretofore believed that the *pyridine* which they had recognized as being closely related to the alkaloids, and which they usually obtained for their experiments from certain manufacturers, was obtained from bone-tar (product of the dry distillation of bones), as this was supposed to be a much more abundant source of the substance than coal-tar or other compounds which were also known to contain it. Prof. Ladenburg was led to the above supposition because the manufacturers used to supply the crude pyridine under the name of "Thier-öl-basen" ("bases from animal oil"). It now turns out that in spite of this name, the commercial crude pyridine is all obtained from coal tar.

The dextrogyre portion of alpha-propyl piperidine having thus been extracted and identified with natural coniine, it remained only to separate the lævogyre portion contained in the syrup soaked up by the blotting paper. It was first tried to remove from it any of the dextrogyre salt still contained therein, but this was unsuccessful. However, by the aid of iodide of cadmium, which forms double salts with coniine and many other alkaloids, a partial separation of the lævogyre salt was accomplished, the resulting base being, however, only approximately pure.

Disinfection.

The following directions for disinfection are contained in the official *Formulaire Pharmaceutique* of the Paris hospitals:

1. Before employing any disinfectant, search for the cause of infection, with a view to suppress it. Particularly look to the tightness of sewers, construction of closets, etc.

2. *Personal Disinfection.*—Surgeons and their assistants should wash their hands first with soap and water, and afterwards with either one of the following solutions:

a.	Carbolic Acid	50 parts.
	Glycerin	75 "
	Water	1,000 "
b.	Corrosive Sublimate	2 parts.
	Chloride of Sodium	2 "
	Water	1,000 "

3. *Disinfection of Bedding, Clothing, Curtains, Carpets, etc.*—Expose the objects, during twenty minutes, to steam under pressure, in a suitable apparatus, such as that of Géneste and Herscher, at a temperature of at least 105° C. (221° F.). Dry air, even at 120° C. (248° F.), does *not* disinfect bulky articles, even after several hours; and woollen goods are rendered reddish-brown by it.

Blood, fecal matters, and colored albuminous dejections leave indelible stains upon fabrics, if these are heated to about 100° C. (212° F.) The stains found on coverlets, mattress covers, etc., are first washed with a dilute solution of hypochlorite of sodium (about 1 volume of Labarraque's solution in 300–400 volumes of water).*

Shoes should be washed with the following solution:

	Corrosive Sublimate	2 parts.
	Chloride of Sodium	2 "
	Water	1,000 "

4. *Disinfection of Linen, etc.*—Bedclothing, linen, etc., which is soiled by dejections or blood, should first be soaked or rinsed in the above-mentioned dilute solution of hypochlorite of sodium (called *chlorozone* in the original), then wrung out, and afterwards put in the steam-heating apparatus. Or the articles may be boiled in the liquid just mentioned. Or they may be kept from six to twelve hours in a weak solution of chloride of lime, obtained by inclosing chloride of lime in a sack of stout material and hanging it into the water. About one pound of chloride of lime is required for every twenty-five gallons of water.

* This will be found too dilute. The strength to be used will depend upon the intensity of the stain and the nature of the fabric.

In order to avoid the scattering of germs, the fabrics should be immersed in the liquid previous to being sorted out and counted.

Leather is disinfected by applying to it, with a brush, a solution of

Corrosive Sublimate	16 grains.
Chloride of Sodium	16 "
Water	1 quart.

5. *Infectious Fecal Discharges.*—Place into the porcelain vessel (intended to receive them) beforehand some 4 or 8 ounces of a 5-per-cent solution of hydrochloric acid or of chloride of lime, or the following:

Sulphate of Copper	1½ oz.
Sulphuric Acid	1¾ oz.
Water	1 quart.

6. *Sick-Rooms, Unoccupied.*—These are treated either by sulphur or nitrous fumigations.

a. Sulphur Fumigations. Close up all exits and fissures [except one or more, to be closed after the disinfecting process has been started]. Boil some water in the room for at least one hour in a vessel placed on a suitable heating-apparatus. Place pieces of sulphur into sheet-iron pans having low sides (about 12 inches in diameter, and 2 inches high), standing upon beds of sand. Add a little alcohol to each, and then ignite them. For every 35 cubic feet, 300 grains of sulphur should be used. Close the last exits. After twenty-four hours open the room and ventilate thoroughly.

b. Nitrous fumigations. Into a cup, placed inside of a stoneware jar, put crystals of nitrosyl-sulphate (sulphonitrous acid; the lead-chamber crystals of sulphuric-acid works), of which about 16 grains will be required for every 35 cubic feet. Then place the vessel under a faucet, and adjust the latter so that water will fall upon the crystals drop by drop, which will cause the immediate disengagement of reddish fumes. Close the room until the following day. Be particularly careful not to inhale the escaping vapor of the gas, or the air of the room, charged with the vapors, on opening it. It is best to have two vessels containing the disinfectant, one at each end of the room.

After either one of the above fumigations are completed, wash the walls and floor of the room, by means of a painter's brush, with a 2-per-cent solution of carbolic acid.

7. *Disinfection of Wagons* [*Ambulances, etc.*].—Sick-wagons should be disinfected in the following manner:

Wagons which can be closed are disinfected like sick-rooms, by means of the before-mentioned nitrous fumigations. Wagons lined with cloth may be likewise disinfected in this manner; but open wagons must be disinfected in a special shed which can be closed.

Wagons lined with moleskin or plush are disinfected like shoes, viz., by washing them with a solution containing 2 parts, each, of corrosive sublimate and of chloride of sodium in 1,000 parts of water.

Alaninate of Mercury.

ALANIN ($C_3H_7NO_2$) is a body derived from lactic acid and propyl-glycol. It is also known as lactamine or amido-propionic acid.

In order to obtain the alaninate or amido-propionate of mercury, alanin is dissolved in 20 parts of water, the solution raised to boiling, and then gradually saturated with mercuric oxide, added in very fine powder and in small quantities at a time. The filtered solution is evaporated, and there will be obtained a white, crystalline powder, soluble in 3 parts of cold water. This solution is colorless, and keeps indefinitely, even though exposed to air and light.

De Luca recommends alaninate of mercury, in form of hypodermic injection, in doses of 5 to 15 milligrammes (1/12 to ¼ grain) per day for adults, in the treatment of syphilis. A course of forty-five days is stated to often be sufficient to bring about a permanent cure.

In children, the remedy is to be administered per os, in doses of 2 to 5 milligrammes (1/30 to 1/12 grain).—After *Arch. de Pharm.*, June.

The Camphor Monopoly at Formosa.

IN reply to a communication of the American Minister to China, in which he asked that the camphor industry of Formosa should be conducted under the rules formerly in use, and not as a Government monopoly, the Yamên (Chinese Foreign Office) state that the whole aspect of the camphor industry upon Formosa has changed since the rules were made (in 1869). There is no more camphor produced in the territories adjacent to the sea-coast, though, if any camphor is procurable there, it may still be purchased by foreign merchants, whether it is "official" or not. The custom passes which foreign merchants require for travelling on business specially stipulate that they must not proceed "to places in close proximity to the country occupied by the aborigines and their trade." The provincial monopoly in camphor is in that produced in the inner mountainous region inhabited by the aborigines, which has been brought under subjection by the governor. The government has established military stations there, both as a means of keeping the aborigines in subjugation, and to protect the business.

AN IMPROVED EXTRACTION APPARATUS.

A. A. LUMSDEN describes an extraction apparatus (in *Chem. News* of March 29th) which has several useful features, one of which is the small quantity of solvent required, which is used over and over again until the substance is exhausted. The author says:

The apparatus I constructed for myself some years ago, and have since used exclusively without accident or trouble, is a modification of Church's apparatus, the essential improvement being in the removal of the danger of bursting the flasks, or driving out the corks, by pressure during the distillation. The extraction of a sample occupies no more than an hour as a rule, while the recovery of the ether is accomplished, and loss by evaporation is avoided, just as effectively as with any other apparatus.

The tube *T*—a piece of ordinary combustion tube, drawn out to go through the cork of flask *a*—contains the substance, which is kept in its place by a plug of cotton pushed pretty tightly into the lower end of tube, and by a more loosely fitted plug, held down by a spiral string of common wire. The tared flask *a* is short and wide, with a capacity of 80 to 90 C.c., and is heated in the usual way by a beaker of hot water. Flask *b* has a similar capacity to *a*, but is preferably of a taller form, and is inserted in a beaker of cold water kept overflowing by a continuous stream from the tap, passing first through the condenser. The tube leading from *T* to the bottom of the flask *b* is ¼ inch in diameter and has no joining. The cork of *b* has a small V-notch opening to the air, to prevent either pressure or rarefaction in the apparatus as the process proceeds. The whole is suspended by a string attached to any convenient fixture, and can thus be adjusted to make the flasks hang at a suitable height in the beakers.

When an extraction is being commenced, 2 or 3 C.c. of ether are put into flask *a*, *b* is half filled with the same liquid, and the corks are all firmly inserted. The apparatus is now lowered to its normal position, when the ether in *a* is vaporized, expelling the air. The apparatus is now lifted bodily (by taking hold of the condenser) and flask *a* is plunged into a beaker of cold water standing beside the hot one. In a few seconds, the liquid ether in *b* is completely drawn into *a*, carrying along a portion of the oil in the sample. Flask *a* is again inserted in the hot beaker, when distillation commences, and is allowed to continue until the greater portion of the ether be condensed in *b*; *a* is again dipped in the cold water, and the operation is repeated until the sample be completely extracted.

I find it convenient to use two hot-water beakers, one standing over an argand and ready to replace the other at each new distillation.

PREPARATION OF ABSOLUTE ALCOHOL.

ON a small scale absolute alcohol may be obtained, according to J. Habermann, by introducing caustic lime, in small fragments, into a glass tube *b*, about 28 inches long, and 1¼ to 2 inches wide, which is connected, in an upright position, with the distilling flask. The lime is, however, not poured into the tube directly, but is made to fill the space between the walls of the tube and a narrow roll of iron wire gauze *c*, which is made to occupy the centre of the tube, and the object of which is to permit the passage of alcohol vapors upward, when the lower layers of lime begin to become semi-liquid. To completely dehydrate 4 C.c. of 95% alcohol, 1 Gm. of lime is required. At first, the contents of the flask must be heated very slowly and gently on a water-bath, so that but little distils over during the first two hours. Then the receiver is changed, and the distillation made to proceed more rapidly. As soon as the lime has become semi-liquid, the tube is exchanged for another.—After *Chem. Centralbl.*, No. 24.

A Substitute for Cod-Liver Oil.

PROF. LÉPINE (in *Rép. de Pharm.*, July, 1888), after having discussed the nature of an oil emulsion in general (see page 171 in this number), turns to the subject of cod-liver oil in particular, and first quotes the observation of Berthe that bleached cod-liver oil is much less easily absorbed than the brown. The cause is this, that the latter contains between 6 and 11 per cent of free fatty acids, while the bleached contains only about 0.4 per cent. Buchheim, who recognized the importance of having free fatty acids present, some years ago proposed to add these to cod-liver oil, or to administer them separately. And quite recently Mering recommended the employment of partially saponified oil of olive. The substance Lipanin which is made by Kahlbaum, of Berlin, and has recently been introduced in medicine, is nothing else than olive oil, in which a small quantity of free fatty acids has been set free (about 6 per cent), and converted into soap.

Salkowski criticises this preparation. Instead of a partial saponification he prefers the direct addition of pure oleic acid, or of erucic and palmitic acids. The latter is objected to by Mering, as it is apt to crystallize out, while the former is liable to become easily rancid.

In place of using olive oil, Mr. Fournie, chief pharmacist of the Lyons hospitals, has selected, at Prof. Lépine's suggestion, a new vehicle to carry the free acids, viz., *butter*.

To make the preparation, the butter is first melted, washed with alkaline water, and afterwards with pure water, being thereby deprived of casein, serum, and volatile fatty acids. It is then mixed with 5 per cent of its weight of a mixture of fatty acids obtained in the following manner. A specified quantity of butter is saponified; the resulting soap is decomposed with an acid with the exclusion of air (under a current of carbonic acid gas) and at a low temperature, to avoid the formation of oxyoleic acid. The supernatant fatty acids are removed after cooling, then washed with several portions of water at a temperature of 75° C. (167° F.), and afterwards added to the purified butter. The product is absolutely free from odor and disagreeable taste, provided the process has been carefully conducted. It may easily be mixed with medicaments, so far as they are not incompatible. This method of operation is deemed by the originators preferable to that involving the use of pure oleic acid, as this is worth some ten dollars a pound.

Regarding the effects of treatment of consumptives with this new agent, experiments have not far enough advanced to give a decisive statement. Meanwhile, as there is great activity at present among observant therapeutists, in experimenting with new agents to combat the old enemy, phthisis, the publication of the above process will afford to those who desire to do so, a chance to try it.

The Pharmacopœial Assay of Cinchona.

THE Pharmacopœia Committee of the German Pharmaceutical Association propose the following text for the article "Cortex Chinæ" (Cinchona) in the next edition of the German Pharmacopœia:

Cortex Chinæ. Bark of the branches and trunk of cultivated species of cinchona, chiefly of *Cinchona succirubra*, occurring frequently in rolls of about 60 Cm. (23 inches) in length, 1 to 4 Cm. (½ to 1½ inches) in diameter, and 2 to 4 Mm. (ab. ¼ to ½ inch) in thickness. These brittle barks have a thin, grayish-brown cork, with coarse longitudinal ridges and short diagonal fissures, and have a brownish-red, fibrous interior. Under the microscope, the bark exhibits the bast-cells peculiar to the cinchonas.

On heating 0.1 Gm. of the bark in a test-tube to redness, a fine carmine-red tar is produced.

Cinchona bark yields a reddish-brown powder, which should contain not less than 3.5% of alkaloids.

Shake 20 Gm. of the powder repeatedly and energetically with 10 Gm. of water of ammonia, 20 Gm. of alcohol, and 170 Gm. of ether, and after twenty-four hours pour off 100 Gm. Add 3 C.c. of normal hydrochloric acid, and 27 C.c. of water, then remove the ether and alcohol by distillation and, if necessary, add more normal hydrochloric acid, so as to render the liquid acid. Then filter and while the liquid is cold add to it, while stirring, 3.5 C.c. of normal potassa solution, or such a quantity thereof as will be required to cause phenolphthalein paper dipped into the liquid to acquire a red tint. The precipitate is collected upon a filter, and gradually washed with a little water, until the escaping drops cease to redden phenolphthalein paper. Allow the precipitated alkaloids to drain, press them gently between blotting poper, dry them in the air sufficiently to transfer them upon a watch-glass, and then dry them completely, first over sulphuric acic and then on a water-bath. The weight of alkaloids thus obtained and dried at 100° C. should not be less than 0.35 Gm.

On treating the alkaloids thus obtained and reduced to a fine powder, with 15 C.c. of ether, added in several portions, not more than one-half of their weight should remain undissolved. On shaking the ethereal solution with diluted sulphuric acid, a few drops of the latter, mixed with several cubic centimeters of water, should give a bluish-fluorescent liquid, which assumes a handsome green color upon addition of chlorine water and excess of ammonia.

The Committee adds the following comments: The changes which are here proposed in the method of assaying cinchona bark rather concern the manipulation than the principle. In the first place, 100 Gm. of the extract are taken for assay, as these correspond to 10 Gm. of bark. [No account, however, is taken here of the weight of alkaloids contained in these 100 Gm. Supposing the bark, of which 20 Gm. had been taken for assay, to contain 4 per cent of alkaloids, then the 200 Gm. of mixed solvent would extract these and become 204 Gm. Hence it would be necessary to withdraw 102 Gm. of the liquid to repre sent 10 Gm. of bark. As, however, the actual percentage of alkaloid in the bark is unknown previous to the analysis, and the possible error is usually very small, we agree with our German confrères that it may be disregarded.—ED. AM. DRUGG.] On adding the 3 C.c. of normal acid, some water must be added also so as to enable the alkaloidal salt to enter solution. The ether cannot all be removed by spontaneous evaporation, as in this case the concomitant alcohol would also remain behind. It is absolutely necessary to heat the liquid so as to drive off the alcohol, in order to cause the alkaloid to be precipitated in a liquid entirely free from alcohol. The distillation must be conducted in the water-bath, and continued until nothing more passes over. The quantity of caustic alkali required for precipitation is easily ascertained by employing strips of paper impregnated with alcoholic solution of phenolphthalein. If such a strip is colored red, when dipped in the liquid, an excess of alkali is present, and the precipitation completed. In the same manner the completion of the washing is ascertained. Phenolphthalein reveals the presence of caustic alkalies with great distinctness by becoming red; but free alkaloids (though they turn litmus blue) have no influence upon phenolphthalein [that is, alkaloids from cinchona; Flückiger, however, has found that both atropine and hyoscyamine are capable of reddening phenolphthalein paper.—ED. AM. DR.].

The assay of the bark is proposed to be extended to a determination of the amount of ether-soluble alkaloids. [In the present German Pharm. this had not been provided for, but it has been in the U. S. Pharm.] This is done by treating the finely triturated total alkaloids with small quantities of ether until 15 C.c. of this have been consumed. The identification of quinine or quinidine in the ethereal solution is performed as prescribed in the text, the fluorescence being particularly prominent when the liquid is as highly diluted as the test prescribes.

The Cardamom Plant.

THE cardamom of commerce, *Elettaria Cardamomum*, a member of the natural order of Zingiberaceæ, is indigenous to the forests of Malabar, where it is found growing wild at altitudes ranging from 1,800 to 3,500 feet above sea level. A moderate degree of shade and any amount of moisture are the climatal conditions most favorable for the plant's luxuriant growth.

If the shade be too profound, the stalks which spring from the rhizome will be but few in number, but if sunlight be moderately admitted, they will increase amazingly, often exceeding seventy in number; but if exposed to sunshine for more than an hour or two daily, the plant languishes and eventually dies out. Each stalk throws out a scape, or peduncle, varying in length from 1½ to 2½ feet, on which the fruit is produced in the form of capsules, arranged in an alternate manner on each side of the shaft, at a distance of about 2½ inches from each other. From the description of the plant above given, a large crop might be expected, but the result does not fulfil the expectation to the anticipated extent, as, owing to the large amount of moisture contained in the vegetable tissues of the cases which cover the grains, one pound of the green fruit reduces down to one quarter or sometimes one-fifth of a pound, when fully dried.

In its natural climate and soil, a sandy loam devoid of clay, the plant begins to bear in the second, and yields a full crop in the fourth year. My experience does not enable me to state precisely the yield of each plant. I think that the planter may consider himself fortunate if he succeeds in harvesting, on the average, one-quarter pound of dry cardamoms per plant in the total number of sixty plants which occupy an acre, in the fourth year, less a certain percentage of loss occasioned by rats, squirrels, and snakes, all which species of vermin evince a partiality for the fruit, and are ever on the watch to pounce upon it the moment it becomes ripe; and this entails the necessity of great watchfulness on the part of the planter to forestall these marauders, and be in the happy position of that early bird which proverbially "gets the worm." Each stalk, as it completes its functions in bringing its scape to maturity, and becomes effete, is succeeded by another stalk, sprouting from the parent rhizome, which begins to bear in the course of a year; and in this order the growth proceeds with successive renovations, until the plant attains its ultimate span of existence, in the lapse of time; the extent of duration of which is not accurately known to the writer.

Until Ceylon glutted the home markets, cardamoms sold well, but they hardly fetch remunerative prices now, as the quotations have fallen from 5*s.* a lb. to 1*s.* 4*d.*, and even less for the small kinds, of which there is a considerable proportion in all lots, and which sell for about 8*d.* a pound. The spontaneous way in which the plant was for a long

time supposed to be exclusively produced, viz., from the concussion of the ground occasioned by the fall of a large tree felled over it, was, if not a purely fanciful idea, probably a cunning one suggested by the interested motives of those who were the fortunate holders of the cardamom hills and habitats. Whether such an origin has any better foundation to rest upon than mere imagination, it would be idle here to discuss, as there is no question of the fact that cardamoms can be reared from seed sown in shaded nurseries in the ordinary way, or from the division of the rhizome into parts containing young shoots or eyes fit for development into them. The former is undoubtedly the quickest way of forming a plantation, although it must be admitted the seed is singularly slow in germinating, taking never less than three and often as many as five months before the little spikes show themselves above ground. Within a year from this time, the plants will, with careful culture, have attained a sufficient size to be planted out into pits dug for their reception, in the shade of the forest, suitably prepared by trenching, and the thorough extirpation of root and branch of the brush-wood occupying the surface. The process cardamoms are put through, called "bleaching," is a tedious one, and if left to agents, particularly costly. It is done by exposing them to the fumes of sulphur in closed receptacles—a process which has the effect of transforming their dingy gray into a delicate pale straw color. This may be called one of the tricks of the trade, which, while perhaps it may not appreciably deteriorate or detract from the quality or flavor of the grains, captivates the public eye and secures a better price.—*Tropical Agriculturist.*

On the Nature of Oil Emulsions.

In the course of a paper on Cod-Liver Oil (in the *Répert. de Pharm.* July, 1888), Prof. Lépine discusses the mode of formation of emulsion of fixed oils, and draws certain conclusions therefrom. Though no specially new facts are there advanced, yet it is worth while to give an abstract of this portion of the paper.

When an emulsion is to be prepared artifically, we are obliged to have recourse to violent agitation. On the other hand, when an oil is emulsified in the intestinal canal, the feature of violent agitation is absent, there being merely the peristaltic action of the intestines. The author quotes the explanation which was given by Gad (in *Dubois' Archiv*, 1878, 1881), to account for this. Supposing we add to the solution of an alkali contained in a watch-glass, very carefully a single drop of a fixed oil *containing about 6 per cent of free fatty acids*, there will soon be observed a whitish zone forming around the drop of oil. Upon very gentle agitation, some small particles will be observed in this zone, having an active motion, and these particles will, upon a slightly increased agitation, be recognized as minute droplets of fat which separate from the main drop. It has been assumed that the latter contains some free fatty acid. Any molecules of this which happen to be about the surface of the drop will be converted into soap by the alkali, and the resulting soap-molecules, dissolving in the water, produce centrifugal currents and movements. Under their influence, the drop of oil throws out more or less extended projections, which, upon separating, constitute minute droplets.

Each of these is coated by a thin pellicle of soap which prevents the droplets from running together. Under these conditions, the emulsion is *stable.*

In order that the experiment shall succeed, there must be a certain proportion of fatty acid in the fixed oil. The soap which is produced must be rather soluble, and not in too large a quantity, the density of the surrounding liquid must be suitable, etc. If all these conditions are fulfilled, the emulsion is perfect. All conditions being equal, cod-liver oil forms a better emulsion than any other fatty substance.

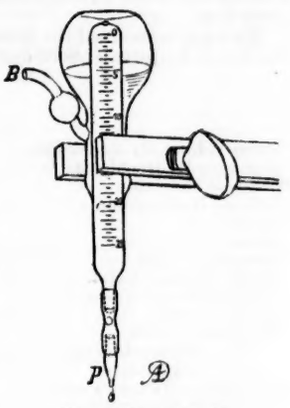
As has been shown by Hofmann, fatty substances are frequently acid. Thus, even the purest olive oil always contains a trace of free oleic acid. But it is in the intestinal canal, as has been proven by Claude Bernard, and under the influence of the pancreatic juice, that neutral fats undergo a partial decomposition, resulting in the formation of free fatty acids. The latter then decompose the alkali carbonates, and saponify with the alkaline bases, the resulting soaps, when dissolving, producing the above-mentioned currents. In this manner emulsions are formed in the duodenum, there being this additional feature (compared with artificial emulsions) that the presence of albuminous matter, and still more that of bile, assists the formation of the emulsion, there being, besides, other factors which are not yet clearly made out.

Instantaneous Remedy for Hiccup.—The following method of suddenly cutting short hiccup is, perhaps, not altogether new, but combines several features sometimes recommended singly as a cure for the trouble.

Close the external auditory canal of both ears with the end of the index-fingers with a moderate pressure. At the same time drink a small quantity of some liquid, no matter what, in repeated portions, the liquid being held to your mouth by a second person, in a cup or glass. The hiccup will then instantly stop.—*Bull. de Thérap.*

A BURETTE-FLASK.

H. Morgan's burette flask can not only be used like an ordinary burette, but also permits the gravimetric determination of the amount of liquid contained therein or taken therefrom. The total weight of flask and burette, when empty, amounts to only 50 to 55 Gm. The burette tube is fused into the neck of the flask, and reaches to within about 1 millimeter of its bottom, having a small opening at its closed end. The lateral tube *B* serves for the admission of air during titrating and when filling the burette; likewise also, of course, for filling the flask. When the burette is be filled, the flask is set on its bottom, *P* is opened, and by compressing the bulb *B*, the liquid is forced into the burette. Then the orifice *P* is closed.—*Jour. Anal. Chem.*, 1888, 1.



Morgan's burette flask.

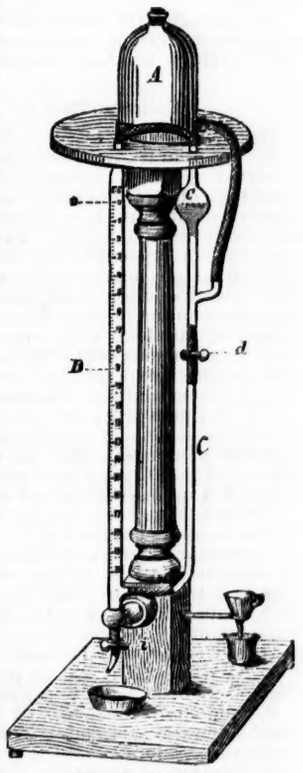
A SELF-ADJUSTING BURETTE.

A burette which fills itself to the zero mark or to any other mark previously determined, has been devised (and patented) by H. Oppermann, of Bernburg, Germany. (Germ. Patent No. 43,568.)

The burette *B* has a lateral branch near the stop-cock, which is connected with the tube *C* in the manner shown in the cut, a separate branch connecting *C* with the reservoir of the reagent *A*.

At first, stop-cock *i* is opened, which causes liquid to flow from the reservoir into the upper branch of *C*. On opening now the stop-cock *d*, the contents of *C* will flow down and enter the burette. When enough liquid has entered the latter to fill it either to the zero point or to any other previously determined mark, the level of the liquid in both branches will be alike, the two branches communicating with each other by means of flexible tubing. The air confined in this communicating tube remains unchanged, only varying in density.

If the pinch-cock *d* is shut, and liquid allowed to flow from the burette, by opening the pinch-cock at *i*, the column of liquid in the two portions of the tube *C* will remain unchanged. When *i* is closed again, it is then only necessary to open *d*, which will cause exactly as much liquid to flow from the reservoir as had previously been withdrawn from the burette. In other words, the liquid will flow until the air confined in the curved flexible tube is back again at its original density.



Oppermann's burette.

Micromillimeter.—A recent communication to *Nature* by Prof. Rücker calls attention to the fact that the term *micromillimeter*, which has long been in use among scientists as equivalent to the "one-thousandth of a millimeter," should no longer be used in this sense. The Committee of the British Association for the Selection and Nomenclature of Dynamical and Electrical Units laid down the rule that the prefixes *mega* and *micro* should be employed for multiplication and division by one million. The term micro-millimeter is now used by physicists who adhere to the new rule, in the sense of "*one-millionth of a millimeter.*" The Royal Microscopical Society have directed the editors of its journal to abandon the use of the term micro-millimeter in the old sense, and to use instead of it, the term *mikron* which had also been employed for it formerly. This is to be represented by the Greek letter μ while the millionth of a millimeter or micromillimeter, will be designated by $\mu\,\mu$.

Hypodermic Injections.

THE *Formulaire Pharmaceutique* of the Paris hospitals gives the following list of typical hypodermic injections, containing such a quantity of the several medicaments that the usual hypodermic dose (say about 15 minims) will correspond to the average dose for adults of the respective remedies.

We have converted the metric terms of the original into the nearest equivalents of our weights.

	In 150 min. of water dissolve	15 min. will contain about
Apomorphine Hydrochlorate,	1½ grains	⅛ grains.
Aconitine Hydrochlorate,*	1/10 "	1/100 "
Atropine Sulphate,	0.15 "	1/64 "
Caffeine Hydrobromate,	3 "	¼ "
Codeine,	1½ "	⅛ "
Curare,	0.15 "	1/64 "
Duboisine Sulphate,	0.15 "	1/64 "
Ergot, Aqueous Extract,	10 "	1 "
Eserine (Physostigmine),	0.15 "	1/64 "
Hyoscyamine,	0.15 "	1/64 "
Morphine Acetate,	1½ "	⅛ "
" Hydrochlorate,	1½ "	⅛ "
" Sulphate,	1½ "	⅛ "
Pilocarpine Hydrochlorate,	3 "	¼ "
Quinine Hydrobromate,	25 "	2½ "
" Hydrochlorate,	7 "	¾ "
" Sulphate (+ Cit. Acid),	3 "	¼ "
" Sulphovinate,	40 "	4 "
Strychnine Sulphate,	½ "	1/20 "

The following are directed to be dissolved in *Liquid Vaseline* as a vehicle:

Eucalyptol, Thymol, Bisulphide of Carbon, Carbolic Acid, Chloroform, Iodoform, Iodine, Bromine, Phosphorus, Calomel (! suspended ?), Yellow Oxide of Mercury (suspended ?).

We only give the names of the substances without the strength of solution, as it is not likely that the above-mentioned vehicle will long continue to be employed.

Delicate Test for Nitrous Acid.

THE most delicate test for nitrous acid so far discovered is the reaction it gives with metaphenylene-diamine, first reported by Gries. Several other allied bodies have since then been observed to give a similar reaction, and various improvements have been pointed out to make the test even more delicate and certain. Zambelli proposed the modification to employ sulphanilic acid. The liquid suspected to contain nitrous acid or a nitrate is treated with a drop of a saturated solution of sulphanilic acid, then a drop of an aqueous solution of phenol is added, and the liquid then rendered alkaline with ammonia. According to the amount of nitrous acid present, the liquid will assume a tint varying from faint-yellow to intense reddish-yellow (like a strong solution of bichromate of potassium).

David Lindo tried the effects of various other phenols besides carbolic acid (which was the phenol employed by Zambelli), in order to find out which is the most sensitive. He found that *thymol* is sometimes preferable, and he also succeeded in making the test more decisive in other ways.

The test is performed in the manner below described.

The reagents required are:

1. Standard solution of Nitrous Acid. This is not specially described by the author, who only speaks of a solution of nitrous anhydride (N_2O_3), containing one part of this in one million. But for practical purposes an equivalent quantity of pure nitrite of potassium, or better, nitrite of silver, may be used.

2. Solution of Thymol, 10 per cent, in alcohol, or solution of Carbolic Acid, 10 per cent, in diluted alcohol.

3. Sulphanilic Reagent. A cold mixture of 1 part of pure sulphuric acid and five parts of water saturated with sulphanilic acid.

4. Solution of Ammonia, containing 6 to 7 per cent of ammoniacal gas. Fixed alkalies (*pure*) may be used in place of ammonia, but the latter is preferable.

Assuming, with the author, that we have a 1 in 1 million dilution of nitrous acid, then the test is made and results as follows:

Put 5 C.c. of the nitrite solution into a small test tube. Add 1 drop of the Sulphanilic Reagent, and 1 drop of the Thymol solution. Allow the mixture to be at rest during ten minutes, then add 1 C.c. of the Ammonia solution and mix well.

With a dilution of nitrous acid, such as has been assumed, the color is a yellowish-orange, increasing in depth when stronger nitrite solutions are used.

The author states that carbolic acid will possibly be preferred for *quantitative* work for the reason that it gives a pure yellow, without a tinge of orange, in high dilutions (at and beyond 1 in 1 million) of nitrites, while thymol always causes more or less of an orange tinge. For *qualitative* work, the author appears to prefer thymol, as it gives a deeper tint than carbolic acid in the same dilution of a nitrite.

The color is fully developed immediately, or almost immediately, after adding the alkali—which is a great advantage, particularly when the test is to be employed quantitatively.

The limit of the test, either with carbolic acid or with thymol, is about 1 of nitrous acid in 10 millions of water, the tints being very weak at this dilution.

The above reaction may also be used inversely as a very delicate test for the phenols which have been shown to produce the test. But as quite a number of them give this reaction, it would be impossible to identify the particular phenol. Yet, when it is known beforehand *which* of these phenols is present [as, for instance, in a solution prepared by the operator on purpose, for experimental or other purposes, or, to quote a practical example, when carbolized gauze is to be assayed for its percentage of carbolic acid, or when naphthol or thymol preparations are to be similarly assayed—ED. AM. DRUGG.], then the above test will afford a ready method of ascertaining the quantity present.—After *Chem. News*, July 27th.

The Chinese Cassia Trade.

THE British Consul at Canton reports that the opposition of the cultivators of cassia in the province of Kwangsi, against the newly-formed cassia syndicate caused the viceroy, in the spring of 1887, to again grant to the old cassia merchants permission to trade with the producing districts. These old traders compete very strongly with the syndicate, and consequently the price of cassia fell to the lowest point ever known, viz., $5.60 per picul (133⅓ W.), at which large contracts were made. The shipments of cassia lignea and broken cassia from Canton, during the year 1887, reached the enormous amount of 140,733 piculs, against 79,434⅓ piculs in 1886, while in former years an export of 100,000 piculs was considered exceptionably high.

How to Make Jujubes.

TAKE 2 lb. of picked gum arabic, 1¼ lb. of the finest sugar sifted, 5 oz. of orange-flower water, and 1 pint of pure water. Powder the gum and then put it into a bright clean basin with 1 pint of water, and dissolve it over a slow fire, stirring constantly with a wooden spatula. When it is entirely dissolved, strain it through a towel or fine hair sieve to free it from all sediment. Put the strained gum and the sugar into another clean bright basin, and stir it over a very moderate fire while it boils and reduces to the "small pearl" (or 30° by the saccharometer); then add the orange-flower water. Stir all together on the fire, take off the scum, and pour the mixture into very smooth clean tin pans that have previously been well rubbed with oil of almonds, or with olive oil; fill them with the mixture to the depth of a quarter of an inch, and set them to dry in the drying-room at a moderate heat. When sufficiently dried, so that in pressing the surface it proves to be somewhat elastic to the touch, remove them from the heat and allow them to become cold; the jujube may then be easily detached and removed from the pans, and is then to be cut up with scissors into strips, and then the strips into diamond-shaped pieces. The jujubes can be colored with cochineal or ammoniated carmine solution, may be flavored with vanilla, rose, etc., and may be medicated.—*Brit. and Col. Confect.*

Ricin.

THE well-known poisonous properties of castor-oil seeds, when eaten, have at length been explained by Dr. H. Stillmark, who has been working at the subject of the toxic principle of the seeds in Professor Kobert's laboratory at Dorpat. He has discovered in them an albuminoid body which he has named *ricin*, and classes among the "unformed ferments." This, however, does not appear to be the purgative principle. Its action, whether given by the mouth or hypodermically, is to produce hemorrhagic inflammation of the gastro-intestinal tract, affecting the small intestine and probably obstructing the bile duct, since there is usually extreme fulness of the gall bladder; the inflammation also extends to the vesical mucous membrane. Diarrhœa is by no means constant. The drowsiness and convulsions which occurred in some of his experiments on animals he attributes to possible thrombosis of the cerebral vessels. The lethal dose of ricin for man he calculates to be 6.9 milligrammes, 1/10 grain for a man weighing 60 kilogrammes, this quantity being equal to about *ten* ordinary seeds; although, Christison once had a fatal case where only three seeds had been swallowed, and on the other hand a case is on record in which a person who had eaten seventeen seeds recovered. Ricin appears to have a peculiar effect upon blood, causing a rapid conglomeration of the red corpuscles, together with the formation of a substance like fibrin. One part of ricin to 60,000 of defibrinated blood is sufficient to cause a separation of the serum, so that the latter is capable of being passed through a filter. Crotonoleic acid, which exists in croton seeds, was found to be quite distinct from ricin. The results obtained by the experiments of Dr. Stillmark find further confirmation in a note in the *Medical Recorder* (July, p. 299), in which it is stated that fifteen children under six years of age, poisoned by eating castor-oil seeds, suffered from severe vomiting and prostration, but not from catharsis.—*Pharm. Journ.*

* The original gives the single hypodermic dose as 1 milligramme (1-64th grain). If Duquesnel's aconitine is used, this would be a highly dangerous dose.

Tincture of Pyrethrum as an Insecticide.

AN old suggestion for the use of a strong alcoholic preparation in the place of the ordinary insect powders is revived by Mr. Harpmann, who recommends the use of a tincture prepared by macerating one part of "insect powder" in twenty parts of 96 per cent alcohol for eight days and then filtering. He says that if this tincture be sprayed in places infested by flies or other insects, it will act similarly to the powder, whilst it only causes very slight irritation to the mucous membrane and leaves hardly any stain. When used in a chamber, it is suggested that it should be combined with a little oil of lavender or some other perfume. This communication incidentally confirms the view that the toxic action of "insect powder" is not due to the fineness of the powder, as had been alleged, but to a definite compound that is soluble in alcohol and very volatile. In fact a distillate from the flowers is said to have the same effect as a pure insect powder.—*Pharm. Centralh.* and *Ph. Journ.*

Sulphonal.

SEVERAL additional papers have recently been published on the therapeutical effects of sulphonal, among which that of Professor Kast is noteworthy. He traces the somewhat considerable lapse of time which ensues before the remedy exerts its soporific influence to its comparative insolubility. Making experiments with water, with common salt solution, with an artificial gastric juice, and with the latter containing an excess of peptones, all at the blood heat, he found it required for solution 450, 250, 200, and 100 parts respectively. From these results the inference is clear that if the remedy is to be rapidly absorbed and therefore rapidly effective, it must be given in considerable quantities of warm liquids. Martin recommends sulphonal as reducing night sweats and increasing sleep in 8-grain doses for phthisical patients, while Leman records excellent results from the administration of 15-grain doses in asthma which morphine and chloral failed to relieve. Dr. Schmey states that 30 grains given to an aged patient (61 years old) suffering from angina pectoris increased the symptoms of that affection, and, therefore, draws attention to its contra-indication in such cases. Dr. Fraenkel, from nearly one hundred trials of Riedel's sulphonal in cases of abnormal sleeplessness, in the usual doses, concluded that its effects were not always equal. In some cases the influence of the remedy was exerted in an hour, while in others it was observed only after the lapse of two or three hours.—*Chem. and Drugg.*

The Manufacture of Quinine in India.

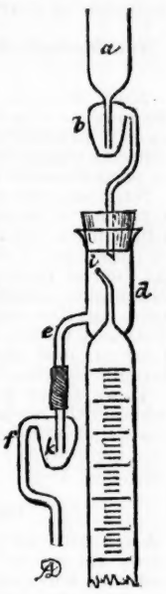
FROM a report on this subject, we select the following description of the process employed in India (after *Chem. and Drugg.*)

The bark is first reduced to powder by means of a Carter's disintegrator and this powder is passed through a scalper, the sieves of which are made of silk and have 120 meshes to the linear inch. This extremely fine powder in the proportion of 100 parts is mixed with 8 parts of commercial caustic soda dissolved in 500 parts of water, and there is then added 600 parts of a mixture of fusel oil 1 part and kerosene oil 4 parts. Slaked lime may be used instead of the caustic soda, 15 parts of it being intimately mixed with the powdered bark before the water. The whole mixture—bark, alkali, water and oils—is next thoroughly agitated in barrels for four hours, then allowed to rest, and the oily layer drawn off from the top. This oil is again agitated for five or ten minutes with water acidulated with hydrochloric or sulphuric acid, whereby the alkaloids are dissolved out from the oil. Separation is again effected, the oil being transferred to the bark mixture, and agitated with it for two or three hours; again drawn off and washed as before in the same acidulated liquor. This process is repeated a third or fourth time, or until it is found by testing a small quantity of the oil that the bark has been thoroughly exhausted of its alkaloids. The quantity of acid required to take up the alkaloids from the oil depends, of course, on the quality of the bark operated on. If the bark contains 4 per cent of alkaloids, about 2 lbs. of sulphuric acid mixed in 20 gallons of water are sufficient. The after-treatment of the acidulated solution of alkaloids is simple. The solution is first neutralized with ammonia or soda and set aside to crystallize. The crystals are collected on a cloth and drained, then dissolved in about fifty times their weight of boiling water, and filtered hot through a little animal charcoal. On cooling after filtration, the crystals again form and are separated as before from the mother liquor by filtration. The crystalline mass obtained is then placed in small lumps on sheets of white blotting-paper stretched on slabs of plaster of Paris. By this means they are practically dried. They are afterwards thoroughly dried by being laid on blotting-paper in a room heated to about 10° above the temperature of the open air. The foregoing presents the salient points of Mr. Gammie's process for the manufacture of sulphate of quinine. The resulting product doubtless contains other alkaloids than quinine, but in what proportion there is nothing to indicate.

IMPROVED BURETTES FOR BARYTA SOLUTION, ETC.

THE use of baryta and various other solutions, in volumetric analysis, is rendered somewhat difficult by the readiness with which they absorb carbonic acid gas from the air. When such solutions are to be frequently, or perhaps constantly, required in actual practice, it is best to adopt some plan by which the access of impure air to the liquid may be permanently prevented.

Such a plan is presented in the arrangement devised by A. Beutell. In this case, the baryta (or other) solution enters the burette from below. This is not shown here, but, as there is no chance of any air getting in at this end, there was no need of doing so. As the liquid rises in the burette, it will finally flow out from the orifice *i*, and pass through the tube *e* into a small reservoir *f*, the flow being stopped when the end of the tube *k* is covered by some of the solution. The cylindrical tube *a* is charged with caustic soda, soda-lime, or caustic baryta, and its lower end is fused into another small reservoir or wash-vessel containing enough mercury to cover the end of the tube. The object of the mercury is to compel the damp air contained within the burette while empty, and which is expelled while it is being filled, to pass out through *e k f*, rather than through *b a*. This effects a material saving of the charge placed in the tube *a*, the functions of which are to take all carbonic acid from that air which is required to enter the apparatus when liquid is allowed to flow from it. —After *Chem. Zeit.*

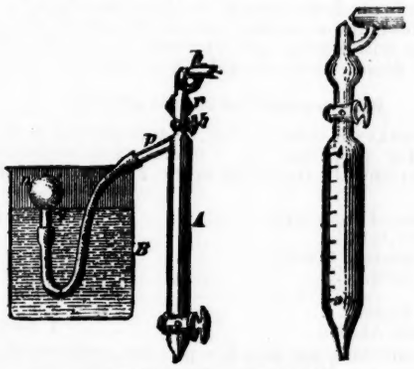


Beutell's burette.

A NEW SIPHON AND PIPETTE.

P. RAIKOW describes, in the *Chemiker Zeitung*, a new siphon which permits to draw the liquid from the top of a reservoir instead of the bottom. The principle of this siphon may be understood by examining the illustration.

The siphon tube proper (*A*) has two stop-cocks. Over the upper one (*h*), the tube is expanded to a bulb which ends in a fine orifice. Opposite to this is the orifice of a blowing tube *b*, arranged as in the well-known spray apparatuses. The short siphon tube *p* is connected, by means of flexible tubing with the glass float *n*, which has a hole *o*, where shown in the cut.



Raikow's siphon and pipette.

When the siphon is to be started, the stop-cock at *h* is opened and air blown through *b*, which will cause the liquid to be aspirated, so that the leg *A* becomes filled with liquid. On closing *h* and opening the lower stop-cock, the liquid will continue to flow off.

The same principle may be applied to the construction of a pipette, in the manner shown in Fig. 2.—After *Chem. Zeit.* and *Chem. Centralbl.*

Ether Drinking in Ireland.—In some places in the north of Ireland ether is largely used as a substitute for whiskey, one reason being its cheapness, inasmuch as a person can obtain for a penny sufficient ether to make him drunk. The subject of ether drinking in certain districts in Ireland has for some years attracted attention, and recently a clergyman moved a resolution bearing on the subject before the General Synod of the Irish Church. He proposed that a petition be presented to Parliament praying for the regulation of the sale of ether as an intoxicant in certain districts. The motion was adopted. There is, it is alleged, a special kind of ether prepared for drinking purposes, and it is also said that, although the excise authorities have been applied to, they have refused to control its sale.—*Br. and Col. Druggist.*

Mercury Salicylate.

THIS compound is being energetically pushed and recommended. As the double salt with sodium chloride is more soluble than the salicylate itself, it is better adapted for use in practical surgery. This double salt has the formula $C_6H_4.COOHgCl.ONa$ and contains 50 per cent of salicylate of mercury.—*Chem. and Drugg.*

New Method of Separating Bromine from Iodine and Chlorine.

JOHN TSAWOO WHITE, of Rangoon, has found that bromine may be liberated from bromides, and estimated, even in presence of iodides and chlorides, by heating the aqueous solution of the bromide or mixture with a solution of permanganate of potassium and sulphate of aluminium.

Supposing the solution to be tested or assayed contains 0.1 Gm. of bromine. Having introduced it into a distilling flask, add to it 10 C.c. of a solution of permanganate of potassium (1 : 25), and make all ready for distillation. At the last moment, add 5 C.c. of an aqueous solution of aluminium sulphate, saturated at the ordinary temperature, and then apply heat. Only bromine will be given off. This may be caught in a standard solution of iodide of potassium, and the liberated iodine—equivalent to the bromine—estimated by hyposulphite.

There seems to be, however, still some uncertainty whether the method can be used for the quantitative estimation of bromine. Meanwhile, it will, at all events, serve as a qualitative test, easily applied.— After *Chem. News*, 1888, 233; 245.

Estimation of Chloroform.

A SOLUTION of caustic potassa in alcohol of 60% decomposes chloroform slowly, but almost completely, at the ordinary temperature, and decomposition is rapid at 100° C. If the strength of the potash solution is known, the excess may be determined by titration, using phenolphthaleïn as indicator, and after the liquid has been carefully cooled, the amount of the potassium chloride formed may be estimated by silver nitrate solution with potassium chromate as indicator. In the cold solution the alcohol and potassium formate have no effect on the titration. In order to employ this method for the estimation of chloroform, the latter is heated with the alcoholic potash in sealed tubes [heating under a well-cooled upright condenser will also answer, ED. AM. DRUGG.], and the excess of potash and amount of chloride formed are estimated.

In order to determine the quantity of chloroform vapor in air or other gases, a known volume of the gas is allowed to enter a vacuous globe into which a measured quantity of alcoholic potash is then introduced. After standing for eight or ten days, an aliquot part of the potash solution is withdrawn and titrated.—L. DE ST. MARTIN in *Compt. Rend.*, abstract in *J. Chem. Soc.*

Effervescent Carbonate of Iron.

DR. HERMANN HAGER, having been requested to devise a formula for preparing an "effervescent carbonate of iron," publishes the following in the *Pharm. Centralhalle* (No. 29):

Sulphate of Iron, cryst.	40 parts
Tartaric Acid	100 "
Bicarbonate of Sodium	166.6 "
Citric Acid	8 "
Sugar	50 "
Oil of Lemon	1.5 "
Absolute Alcohol	1 part

Reduce all the solids to a fine powder, and mix them, in a porcelain [or Wedgwood] mortar, with the Oil of Lemon and Absolute Alcohol, previously mixed together. Then pass the mixture through a sieve, transfer it to a porcelain capsule placed on a water-bath, and stir the mass, while it is being heated, with a glass-rod, until it has become granular. Allow it to become cool, and transfer it to bottles which must be carefully stoppered.

Dose: Sixty to seventy-five grains in "a tumbler filled about two-thirds with water."

Although ferrous carbonate is almost insoluble in water, yet the freshly-prepared solution in water, of the above compound, is scarcely turbid, probably owing to the presence of free carbonic-acid gas.

Detection of Minute Quantities of Bismuth.

M. LÉGER recently made a communication to the Paris Society of Pharmacy, illustrated with experiments, on a test for bismuth which he proposes. One of the most sensitive tests for alkaloids, he said, whether they be natural or artificial, is the double iodide of bismuth and potassium. The reaction, it is true, is quite general and reliable, but not very instructive, because it has never helped us, so far, to form more definite conceptions of the constitution of alkaloids. The idea then came to M. Léger of reversing the test, and using an alkaloid to detect bismuth instead of bismuth to show up alkaloid. He found the reagent very satisfactory in all respects, especially as regards sensitiveness. For obvious reasons, cinchonine was the alkaloid selected. A solution of potassium and cinchonine hydriodate added to a liquor containing 1 per 10,000 of bismuth gave immediately a bright red precipitate; with 1 in 100,000 of water a very appreciable tinge could be observed even from a distance. With 1 in 500,000 a faint hue can with some precautions be recognized. At the same time care must be taken how the bismuth solution is made; there should be no alcohol, no alkalies, or excess of sulphuric acid. To further extend the usefulness of the test, he tried to use it for quantitative estimations of bismuth, but so far without success, owing to the uncertain composition and keeping properties of the precipitate. Hence it can be only recommended as a qualitative test for bismuth, but an excellent one. In answer to a query by M. Petit, M. Léger added that mercury could not be mistaken for bismuth with the test in question. While bismuth affords a very bright red precipitate, mercury gives only a faint yellow one, and but little of it.—*Chem. and Drugg.*

Occurrence of Fluorine in the Organism.

THE method adopted by G. Tammann for the quantitative estimation of fluorine is as follows: The substance under investigation is treated with powdered quartz and sulphuric acid. A current of dry air carries the silicon fluoride so formed through a narrow tube, where it is decomposed with steam and the silicic acid collected on the walls of the tube, hydrofluosilicic acid being also formed; the latter is absorbed in aqueous potash, and evaporated to dryness; the residue is taken up with hydrochloric acid, the potassium silicofluoride precipitated with alcohol, filtered, and titrated with potassa solution. Fluorine is well known to be a constant constituent of bone; it is also known to occur in ploughed earth and in wells. Horsford found weighable quantities of fluorine in the human brain, and Salm-Horstman found that certain plants did not fully develop in the absence of fluorine.

In the present research, plants grown in culture liquids, which did not contain fluorine, were found to die quickly when fluorine was added to such liquids; thus, the addition of 0.1 gramme of potassium fluoride per litre caused death in these plants in twelve hours.

The different parts of the egg were investigated; the shell contained imponderable traces only; the white contained somewhat larger traces, but still imponderable; the yoke yielded weighable quantities; 84 grammes of fresh yolk contained 0.0009 gramme of fluorine. Attention is drawn to the fact that the brain and the egg-yolk, tissues that contain much phosphorus, are also richest in fluorine. In other experiments, brain, cow's milk, and blood, were found to contain small weighable quantities of fluorine.

From these experiments, certain conclusions are drawn, the chief purport of which is, that fluorine is of greater physiological importance in the animal economy than has hitherto been considered to be the case.—*Zeitsch. Physiol. Chem.* and *J. Chem. Soc.*

On the Cultivation of Capsicum Annuum.

IT is well known that capsicum plays a considerable rôle in the culinary art of different nations. In Moravia and Hungary it is known under the name of *paprika*, and much attention is paid to its cultivation. In northern Hungary, "paprika" is called *visk* or *tesser;* and in the district of Pesth, *báthya*. The true home, or rather centre, of cultivation of the plant is Szegedin and its environs, where some 2,500 families are engaged exclusively in its cultivation. Only two species are chiefly raised, namely: 1st, the Turkish or Serbian variety, which is sweet and fleshy—known also in France as Piment doux d'Espagne, Piment gros carré doux; and in South America, Aji dulce—being the *Capsicum tetragonum* Miller. And 2d, *Capsicum annuum* var. *Szegedinensis*. The first mentioned variety is so mild that it is either eaten raw with salt, or is sliced and added as a condiment to potato-salad. In restaurants at Pesth it is served filled with chopped meat. The Transylvanian Roumanians and Saxonians scald and skin it, and in this form eat it under the name of *ardei*.

The pendulous, fleshy pods are distinguished by their angular form, and by the fact that their points end in four to five conical ridges.

The second variety mentioned above has laterally-curved, conical berries or pods, of a scarlet color, about 2¾ to 3¼ inches long, and generally also ridged near the point. The ripe seeds are planted at the end of March in rich garden soil. When the plants are about a finger high, they are dug out, with a lump of soil adhering to the root, and transferred to carefully prepared beds, being planted about 18 inches apart in all directions. Until the flowers appear (June to September), the beds are hoed twice or three times, and the crop is gathered as it ripens up to the time of the first frosts. The fruits are strung upon cords 9 to 12 feet long, and hung up at the southern side of the houses where the ripening process is completed. Finally, they are stored indoors in a well-ventilated place.

The preparation of "paprika," as a condiment, begins with the introduction of the pods into heated ovens, where they are rendered brittle. Then they are comminuted between ordinary millstones, and passed through a sieve. The coarser residue is once more dried and ground, and this latter, known as *csörmöly paprika* ["paprika waste"], is much preferred, as it consists almost solely of the pericarp, and possesses both a fine color and a very mild taste. —After *Industriebl.*

Iodoform as a Hæmostatic.

IODOFORM is recommended by Chauvin and Jorisenne as a powerful, reliable, and rapid hæmostatic. They administer it in pills containing one grain of iodoform made up with extract of gentian or liquorice, three to five being taken daily.—*Med. Press and Circ.; Pharm. Journ.*

Mouth-Wash and Catarrh Cure.

Carbolic Acid	ʒ iv.
Spirit of Chloroform	ʒ iij.
Tinct. of Myrrh	ʒ ij.
Eau de Cologne, to	ʒ vi.

M. To be used with water.

A gentleman who got this lotion from Mr. Stevenson, L.D.S., of Wimpole st., happened to be troubled with a nasal catarrh which a throat specialist's remedies did not cure. He sniffed a little of the mouth-wash up his nose and it stopped the sneezing and watery discharge.—*Chem. and Drugg.*

Condemning Saccharin.

THE Seine council of Hygeine, at their meeting of June 22d, received a committee report on saccharin presented by Dr. Dujardin-Beaumetz and signed by MM. Péligot, A. Gautier, Jungfleisch, Proust, and Riche. The committee declare saccharin to be not an aliment, but a medicament. They are, moreover, convined its only use in industry will be for adulterating alimentary products. The report was unanimously adopted by the council. The probable consequence will be the prohibition of saccharin in all articles of food.—*Chem. and Drugg.*

Chloroform as a Preservative.

PROFESSOR UNNA suggests the employment of chloroform for the preparation of solutions generally and those for hypodermic injection in particular. He believes that chloroform water may, with advantage, be made the menstruum in such liquors as Fowler's solution and for liquor. morphin. hypoderm., which latter may be injected with less pain than accompanies the operation generally.—*Chem. and Drug.*

[We have long recommended this method, and have also employed it practically. It has also found mention in the new National Formulary.]

Solanine.

SOLANINE has been reported to be an efficient analgesic. But it has been found to be inferior to both antipyrin and acetanilide (antifebrin) in acute articular rheumatism. In neuralgia of old standing, however, and in neuritis it is far superior to them. It excels acetanilide in its power to control the phenomena of motor excitement.—*Arch. de Pharm.*

We wish to add that the price of Solanine is so high that its extended medicinal use is not likely to be encouraged at the present time.

Alleged Death from Sulphate of Sparteine.

MR. LAVALLE, pharmacist at Crest, reports to the *Union Pharmaceutique* that a case of death has occurred from the administration of sulphate of sparteine, in doses of about ¼ grain. The physician had prescribed ten doses of ¼ grain (0.05 Gm.), ten doses of 1½ grains (0.10 Gm.), and twenty-five doses of 4 grains (0.25 Gm.). The patient only took the ¼-grain doses, one in the morning and one at night, and died on the eighth day.

The editor of the journal adds that the dose given was normal, and that the death was probably due to other causes. We agree with this view.

Boldoin as a Hypnotic.

ACCORDING to M. Juranville, boldoin, the glucoside of boldo leaves, far exceeds in its hypnotic and narcotic action opium, chloral, or any other similar agent (*Chem. Zeit.*, June 17th, p. 166). The quantity that can be administered to invalids daily without ill effects is stated to be as much as 5 to 10 grammes. The yield of boldoin from the leaves is given as 3 per cent. It may be mentioned that the hypnotic action of this glucoside was observed by Dr. Laborde at the time of its first discovery four years ago (*Pharm. Journ.* [3], xiv., 965).—*Pharm. Journ.*, June 30th.

Chutnee.—The following formula, with gooseberries as one of the ingredients, is given by the *Chem. and Drugg.*

Gooseberries	2	quarts.
Vinegar	2	"
Salt	1	lb.
Mustard Seed	1	"
Stoned Raisins	1	"
Brown Sugar	1	"
Garlic	12	oz.
Cayenne Pepper	6	"

Make a syrup of the sugar with a pint of the vinegar, boil the gooseberries with a quart of the vinegar; bruise the mustard seed and the garlic, and well incorporate the whole of the ingredients in a mortar.

A NEW METHOD OF ASH-DETERMINATION.

THE incineration of substances for the quantitative determination of the ash is in many cases a very tedious and disagreeable operation, partly owing to foaming or swelling of the mass and partly through the formation of difficultly combustible carbon.

Ludwig Reese has succeeded in devising a plan by which this process can be very materially abbreviated. The principle is merely this, that a current of hot air is conducted over the substance contained in a suitable receptacle.

The apparatus recommended for this purpose consists of a wide glass tube *AB*, of difficultly fusible glass, and a similar, smaller one *ab*, which can be pushed into the larger, and in which the incineration is made to take place. The external tube, *AB*, is 40–50 Cm. (16–20 in.) long. Its bore, as well as the length and bore of the smaller tube, depend upon the quantity of substance to be incinerated. The amount employed for this purpose by the author varied between 0.3 and 3 Gm., for which he used tubes of 16–20 Cm. (6¼–7¾ in.) in length, and 11 to 15 Mm. ($\frac{7}{16}$–$\frac{1}{16}$ in.) bore. The end A of the tube *AB* is connected with a water pump (vacuum pump), but it is advisable to interpose, between it and the pump, an empty flask for the purpose of being able to observe the vapors emitted. The smaller tube *ab* is drawn out a little at one end (*a*), and this is packed with doubly folded platinum wire gauze to catch any particles which might be mechanically carried forward by suction.

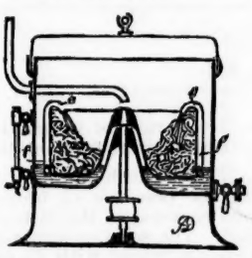
The smaller tube is surrounded by a coil of platinum wire to prevent adhesion to the outer tube when the temperature is high. The incineration itself is conducted in a porcelain boat slipped into the smaller tube.

When an ash-determination is to be made, the weight of the dry, inner tube including boat is first determined. The latter is then drawn out, the substance weighed into it, again replaced, surrounded with the platinum spiral, and introduced into the larger tube. Next, the end *a* is connected with the pump, and while the current of air is passing, the larger tube is heated at *C*. When the water of the substance has been thus carried off, and it begins to decompose, the flame at *C* is made a little larger, the substance at *D* also gently heated and the point *a* somewhat more strongly, to prevent the accumulation of products of distillation. Gradually the heat is raised until the vapors pass through the interposed flask in a copious current, care being taken at the same time that the substance does not swell up so as to pour or flow over the edge of the porcelain boat. Finally, when no more empyreumatic vapors are given off, the heat is again raised a little, and it is observed whether the carbon is all being consumed or not. In most cases, this will occur. Should it not take place readily, a current of perfectly dry oxygen gas is conducted over the substance, the heat being continued. Lastly a current of dry air is conducted through the tube, after the heat has been removed, the tube then withdrawn, allowed to cool in the exsiccator, and weighed.

The analytical data given by the author, who selected for this purpose notoriously obstinate substances, show that this new method saves many hours of work.—After *Zeitschr. f. Anal. Chem.*, 1888, 133.

CENTRIFUGAL EXTRACTION APPARATUS.

IN the extractor patented by Adolf Schulze, of Halle (Germ. Pat., No. 41,772), a novel feature is introduced. The extractor proper is a vessel contained in an outer shell or boiler, and can be set into rapid circular motion by a pulley attachment. The centrifugal motion thereby produced causes the mass contained in the extractor to become impacted against the outer walls. Along the latter run several tubes, *e*, *f*, curving over at the top, and opening with a horizontal orifice below, at such a level that the orifice will be below the surface of the extracting liquid. When the apparatus is charged, and the pulley is set in operation, the rapid circular motion causes liquid to ascend the tubes *e* and *f*, and to be constantly ejected from the upper end over the substance to be exhausted. This operation, therefore, insures the utmost economy in menstruum.



Pharmaceutical Curiosities.

ONE of our subscribers has sent us another batch of curious orders which have occurred in his practice:

5 cent wrth flack side.—5 cts. ipecca serop.—5 cents worth Clordia Lime.—5 cents worth Senia and Mania, and a little Aniseed in it.—10 cents Seltzer powders.—Coroose of supplement for beg bugs.—The wine of ginsengo roots.—A pair of small twers [meant for tweezers] for pulling out. — Lickererspauter [meant for Liquorice powder, comp.].—Sun Coleria Drops.—Iodorform, or odorform, a yellow powder to put on a sore.—Canfreted oil [meant for camphorated oil].

Galvanized Iron Condemned.

ON being consulted thereon, the Paris Council of Hygiene have disapproved of the use of galvanized iron vessels for holding or measuring liquids intended for alimentary purposes. Owing to their cheapness, large tanks and measures were sought to be introduced, but they offer the danger of rapidly contaminating with zinc most liquids happening to come into contact with them. In consequence of the decision, the administration will refuse to affix the legal stamps to any vessels of this description, and will only allow, as heretofore, tinned copper or tinned iron.—*Chem. and Drugg.*

Detecting Pus in the Urine and Other Liquids.

VITALI recommends tincture of guaiac as a delicate reagent to detect pus, even when this has been altered by fermentation, or has become dried up.

If the test is to be applied to urine, the latter is mixed with such a quantity of tincture of guaiac that it acquires a decided milky appearance. It is then warmed to between 35° and 40° C. (90°–104° F.). If pus was present, the liquid assumes a *blue* color. Another method is, to filter the urine, and to treat the filter, while still wet, with a little of the tincture, whereby a magnificent blue color is produced. A very gentle heat promotes the reaction, but a stronger heat prevents or destroys it. In presence of reducing agents, such as hydrosulphuric acid, sulphide of ammonium, etc., and of caustical alkalies, the reaction fails.—*Bollet. farmac.*

Anthrarobin.

AT a recent meeting of the Berlin Physiological Society, Dr. Weyl stated that he had found, as the result of experiments on rabbits and dogs and on himself, that anthrarobin (see our last April number, page 62) possesses absolutely no action on the living organism, even when taken by the mouth in relatively large doses, or hypodermically injected. It appears in an unaltered state in the urine, and he therefore concludes that, nothwithstanding the great affinity for oxygen that it possesses, it passes through the body without being oxidized. Chrysarobin, on the other hand, has a powerful physiological action when taken internally. Dr. Weyl is, however, unable to confirm the statements of several authors that chrysarobin appears in the urine as chrysophanic acid. He believes it is excreted as chrysarobin, and subsequently undergoes the change to chrysophanic acid.—*Pharm. Journ.*, June 30th.

Salicylic Collodion as a Corn Cure.

GEZOW'S formula containing 10% of salicylic acid in collodion, with the addition of extract of cannabis, for preventing pain and inflammation, has, of late, become almost a domestic remedy for corns in Austria, Switzerland, Germany, and parts of Russia. Cases having been reported, however, in which toxic symptoms followed its use, Ivan Binert, an apothecary of St. Petersburg, who saw such a case, declares that the symptoms were evidently caused by the cannabis. As the ingredient is rather superfluous, the salicylic acid being the sole curative agent, Mr. Binert recommends the following formula, saying that he has sold several thousands of bottles without receiving any reports of inefficiency or unpleasant effects. His formula is:

Crystallized Salicylic Acid	10 parts.
Collodion	100 "
Venice Turpentine	1 part.
Chlorophyl (for coloring)	q. s.

Volumetric Estimation of Iodine in Presence of Chlorine and Bromine.

ACCORDING to N. McCulloch (in *Chem. News*), iodine may be estimated in the presence of bromine and chlorine without previous removal of the latter elements, by the following method. The solution containing the chloride, bromide, and iodide is mixed with its own bulk of strong hydrochloric acid, and 20 to 30 fluid grains of chloroform. Standardized permanganate is dropped in, with agitation, until the iodine color at first produced in the chloroform is again discharged owing to the formation of colorless iodine monochloride. Iodine bromide in strong solution colors the chloroform faint yellowish-pink, which cannot, however, be mistaken for the iodine coloration. The process cannot be employed in the presence of free hydrochloric or hydrocyanic acids; the presence of the latter auses high results.—Abstr. in *J. Chem. Soc.*

Impure Pilocarpine.

PILOCARPINE hydrochlorate has been often noticed to fail in producing the desired effect, to the annoyance of both patient and medical attendant. This want of activity and of certainty in action, it is suggested in a communication to the *Therap. Monatsh.*, is due not so much to deterioration through keeping as to the presence of jaborine, which is formed during the isolation of the principle by the action of any acid liquid upon it.—*Chem. and Drug.*

Aluminium as a Natural Constituent of Wheat Flour.

W. C. YOUNG (in *The Analyst*) confirms the statement of Yoshida as to the occurrence of a minute quantity of aluminium in wheat, and shows that, practically, the whole of it is associated with the gluten. A sample of the best Vienna flour gave 0.0075 per cent of aluminium phosphate. The gluten from 250 grammes of this flour was dissolved in acetic acid to purify it, and the solution yielded aluminium phosphate amounting to 0.0074 per 100 of flour.—*J. Chem. Soc.*

Test for Sulphonal.

IF equal quantities of sulphonal and of potassium cyanide (or in place of the latter, of pyrogallic acid) are triturated together in a mortar, and the mixture then heated in a dry test-tube, the latter is quickly filled with dense vapors having the odor of mercaptan. If the melted mass is dissolved in hot water and a little solution of ferric chloride added, a blood-red color is produced, identical with the reaction between potassium sulphocyanide and ferric salts.—G. VULPIUS in *Apoth. Zeit.*, 3,247.

New Method of Determining the Amount of Fat in Milk, Cream, etc.

TAKE a graduated test-tube, having the capacity of about 50 C.c., and divided into $\frac{1}{10}$ C.c., introduce into it exactly 10 C.c. of the milk or similar fatty liquid (with cream, only 5 C.c. are required), then add 10 C.c. of concentrated hydrochloric acid, and boil the mixture, while moving the test-tube to and fro, until the contents assume a dark-brown color. Then cool the tube by immersing it into cool water, add 30 C.c. of ether, shake, and set it aside until the ethereal layer has separated. Measure the latter, remove 10 C.c. of it by means of a pipette, and evaporate this in a tared porcelain capsule on the water-bath, aiding the evaporation by blowing air over it. Finally, dry at 100° C. (212° F.) in a hot air-bath, weigh, and calculate the result for the total volume of the ethereal layer.

If the operation is properly conducted, the ethereal and aqueous solutions will separate sharply and clear, without the least turbidity. The ethereal solution should not show any minute aqueous particles when it flows from the pipette.

The results obtained by this method are perfectly accurate [according to the author], and do not differ, either among themselves, or from the results obtained by other analytical methods, by as much as 0.1 per cent.

The execution of the assay, if everything is properly prepared for it, does not consume more than fifteen minutes.—DR. WERNER SCHMID, in *Zeitschr. f. anal. Chem.*, 1888, 468.

Improved Method of Generating Hydrogen Gas.

HABERMANN recommends to employ for the generation of hydrogen gas, particularly when the well-known apparatus of Kipp (see this Journal, 1887, p. 167) is used—an alloy of 84 parts of zinc and 16 parts of tin, in pieces granulated in the same manner as zinc alone has heretofore been employed. When dilute sulphuric acid acts upon this alloy, hydrogen gas is produced from the first moment of contact in abundant quantity. When the zinc contained in any of the granulated pieces has been dissolved out, the remaining tin, now a metallic sponge, retains the shape of the original piece, and this prevents the access of any metal to the globular reservoir at the bottom. When pure zinc is used, and the pieces become gradually reduced in size until they are able to drop down into the reservoir, it often happens that a further generation of hydrogen takes place in the latter, which is not at all intended, and may sometimes result in the forcing out of some of the liquid contents from the apparatus.—After *Chem. Zeit.*

Oil of Bay vs. Flies.—It is stated that expressed oil of bay (*huile de laurier*) is extensively used in Switzerland by butchers to keep their shops free from flies, and that after a coat of oil has been applied to the walls none of these troublesome pests venture to put in an appearance. This remedy has also been tried and found effectual in the south of France in preserving gilt frames, chandeliers, etc., from becoming soiled. It is even remarked that flies soon avoid the rooms where this application has been employed.

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ITEMS.

Kings County Board of Pharmacy.

A SPECIAL meeting of the Kings County Pharmaceutical Society was held on Thursday afternoon, July 26th, in their rooms, 356 Bridge street, Brooklyn, for the purpose of electing two members to fill the vacancies caused by expiration of term of office in the Kings County Board of Pharmacy, the retiring members being Mr. William P. De Forest, president of the board, and Mr. L. E. Nicot.

The meeting was called to order by President Stevens at 2:30, and the object of the meeting stated.

President De Forest read the report of the board, giving information of its doings for the past three years, showing how the law had been applied for the benefit of the dispenser, the prescriber, and the public, the last being of great importance to be considered, as they were the excuse for its enactment.

The board had met with some antagonism on the part of a few druggists who forgot to sink their personality in the duty they owed to others; the large majority of pharmacists, however, had aided with their moral influence; there had been no occasion to invoke the aid of the courts, for the few who had temporarily defied the board's authority had either, in the end, submitted to its decision or removed from the territory.

Allusion was made to the recent amendment of the law creating the grade of assistant pharmacist, which enabled the board to raise the standard of examination of those who proposed opening stores, while making it easier for those who wished only to serve as clerks.

The subject of interchange of certificates of qualification by the different boards was treated at great length; the Kings County Board favored it, provided other boards required as high conditions for qualifications as they did, and that they reciprocated by receiving the Kings County certificates.

Attention was called to the suggestion of the president of the board, three years ago, of establishing a school of pharmacy for the education of beginners in pharmacy, especially of those who would have to appear for examination; thanks were tendered to the Society for its promptness in acting on that suggestion and establishing the series of lectures. For several years, they had been eminently successful, as nearly every one attending them had passed better average examinations than others; this was especially noticeable in those who had striven for the Fairlie prize; they had been the means of inducing many students to enter the College of Pharmacy, and besides had had a moral and educational effect on the members of the Society.

The point of great interest in the report was the case of the druggist who had been charged by a customer and physician with substituting on a prescription dispensed by an unregistered clerk. The druggist was tried before the board, and though he was given the benefit of all the doubts, the evidence was strong against him and he was unanimously adjudged guilty, censured, fined a sum of money, and his registration suspended.

The board had issued a circular letter to the druggists of the county warning them that the article "Rough on Rats" being proved by analysis to be mainly arsenic, would have to be sold with all the restrictions that any other poison was; replies were received from nearly every druggist in the county that they would conform to the law in that respect.

The report closed by words of congratulation to his associates on the board.

The secretary, L. T. Perkins, read the short report showing the number of men examined and registered during the last term, and turned a surplus of money over to the treasury of the Society.

The Society proceeded to nominate and elect the two members. President De Forest declined a re-election, owing to his having severed his connection with the retail business, as he believed none but those in active work in drug stores should be on a board of pharmacy. Mr. L. E. Nicot and W. M. Davis were elected, and the Society adjourned. The Kings County Medical Society re-elected the two physicians, C. E. De La Vergne and Jos. H. Hunt, who have served for the last three years. The four gentlemen will have to qualify before the County Clerk during the next thirty days, and then proceed to elect a fifth member as secretary, who must be a pharmacist.

The North Dakota Pharmaceutical Association held its annual meeting on the 7th of August. Of a total of one hundred and sixty members, thirty were present. The following officers were elected: president, C. L. Valentine, of La Moure; vice-presidents, D. F. Siegfried, of Sanborn; C. P. Trepanier, of Grand Forks; secretary, H. L. Haussamen, of Grafton; treasurer, E. C. Maxey, of Fargo; executive committee, C. R. Meredith, of Casselton; W. Flath, of St. Thomas; F. H. Divaux, of Valley City; local secretary, P. W. Hawkinson, of Fargo; delegate to A. P. A., H. L. Haussamen.

The following committees were appointed:

Queries—M. D. Fleming, Fargo; C. R. Meredith, Casselton; L. Christianson, Fargo. Revision of Pharmacy Law—The North Dakota Board of Pharmacy; Messrs. Frank Frisby, Bismarck; H. L. Haussamen, Grafton; E. C. Maxey, Fargo; L. Christianson, Fargo, and S. F. Langdon, Casselton.

The Newark Drug Clerks' Association held their regular monthly meeting on August 3d, with a full attendance.

After the reading of the minutes of preceding meeting, the secretary, Mr. Henry Ost, handed in his resignation, which was accepted. He was unanimously elected an honorary member.

Mr. Frank B Meeker was then unanimously elected secretary in the place of Mr. Ost, resigned, and Mr. Otto C. B. Grum was unimously elected to the vice-presidency, vacated by Mr. Meeker.

One new member was elected and three others proposed who will be acted on at next meeting.

The meeting closed with an interesting address by Mr. Ost on the subject of "Beer Brewing."

The Association is now in a flourishing condition, and all drug clerks in the vicinity are cordially invited to attend any of the meetings.

The next meeting will be on Friday, September 7th.

The constitution may be obtained by addressing the secretary, Frank B. Meeker, 861 Broad street.

Chicago College of Pharmacy.—The friends of the members of the class of eighty-eight assembled in the Grand Opera House on the afternoon of July 31st to witness the bestowal of diplomas on the thirty-three graduates, who, with the faculty, occupied the stage. Honorable mention for especial excellence in studies was made of Wm. E. Greiner, of Paris, Texas. Amongst the junior students, R. F. Curti, F. Dempster, Otto Paul, and B. R. Smith received honorable mention. The Hon. Charles Ham, who may be justly regarded as the father of manual training in Chicago, delivered an address. The valedictory was delivered by Thomas W. Sanders. After the diplomas had been awarded by Wm. K. Forsythe, that gentleman delivered the address to the graduates. Martin Heinemann was the recipient of a prize microscope. Prof. H. D. Garrison made the concluding address.

The Alumni Association held a meeting in the evening, at which there was a goodly number of associates of long standing. Several new members were elected. The choice of officers resulted as follows:—President, W. A. Puchner; first vice-president, J. E. Grubb; second vice-president, A. E. Hiss; secretary, A. E. Venn; treasurer, F. F. Gazzolo; executive board, G. R. Baker, J. T. Delfosse, G. B. Farrer, A. A. Winter, E. L. Becker, and G. K. Hermer. It was voted to extend the prize gold medal to the summer term. Power was given to the Executive Board to elect new members, so that it will be unnecessary to wait until the half-yearly gathering at commencement for election to the membership of the association. A committee was appointed consisting of F. M. Schmidt, A. E. Hiss, and A. E. Venn to draw up an expression of regret for the death of the late G. W. Hunt, Actuary of the College, which occurred July 30th.

At a meeting of the College, the following Resolutions were adopted:

Whereas, The messenger of death, who sooner or later comes to all, has visited this College and taken away from us our Actuary, Mr. George W. Hunt, one who was highly esteemed among us as an officer and a man; therefore,

Resolved, That we, the students, faculty, officers, and trustees of the Chicago College of Pharmacy desire to give our testimony to the great respect in which the deceased was held by us. As an officer of the college he was ever diligent and faithful in the discharge of his duties. In all his dealings with the students he was kind, generous, and just, and he invariably won and retained their respect and love. Upon the minds of all the faculty and the other officers of the college he has left the impression of a faithful, upright man and of an affable, cultured gentleman. Those who knew him most intimately were the ones to respect and revere him most.

Resolved, That to the bereaved family we extend our sympathy in this their time of sorrow.

Resolved, That a copy of these resolutions be sent to the family of the deceased, and other copies to the pharmaceutical journals for publication.

CHICAGO, July 31st, 1888.

Correction.

IN the formula for artificial Ems ("Kraenchen") mineral water given on page 142 of last number, the quantity of bicarbonate of sodium should be 22 parts, instead of 2.2.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,215.—**Erlitzki's Fluid** (Boston).

This is a liquid intended for hardening anatomical specimens. Its composition is the following:

Potassium Bichromate	25 parts
Copper Sulphate	5 "
Water	to make 1,000 "

No. 2,216.—**Perfume in Snuff** (Montreal).

A good and durable perfume in snuff cannot well be imparted by making the latter on the small scale. Should you be specially interested in this, we advise you to consult "Karmarsch und Heeren, Technologisches Wörterbuch," edited by Kick & Gintl, 8vo, Prag, vol. VI., pp. 735–745, where the whole process is minutely described and many formulæ given. A copy of this important work is, no doubt, on file in some of the libraries of your city. For ordinary purposes, a good flavoring for snuff is either Tonca-Beans or the so-called American Vanilla, or Deer's Tongue, viz., *Liatris odoratissima*, the leaves of the latter being an important article of commerce.

No. 2,217.—**Aluminium Bronze** (A. E. W. & Co.).

Aluminium bronze is an alloy of pure metallic copper and metallic aluminium. When the proportion of the latter is between 5 and 10 per cent, the alloy has a golden color, is very resistant to atmospheric influences, is easily worked out to wire or sheet, may be readily engraved, and forms an excellent material for balances, scientific instruments, and numerous other articles. Our correspondents inquire, among other things, whether we know of any one who makes weights of aluminium bronze. So far we have not been able to ascertain. But we shall be glad if some of our readers can supply this information. It would certainly be an excellent material for this purpose.

No. 2,218.—**Dilution of Strong Sulphuric Acid for Titration** ("Laboratory").

When strong sulphuric acid is to be titrated, there are several methods by which the acid may be diluted. One is, to slowly introduce a known weight of the acid (dropped from a bottle the contents of which are of a known weight) into water, and when the mixture has cooled, to fill it up to the desired mark. Or, a portion of the acid may be weighed directly in a capacious flask which can be closed with a rubber stopper. The acid cannot be safely diluted with water, but by adding to it gradually some pure, crystallized sulphate of sodium, the water of crystallization of the latter will quietly dilute the acid so that water may be afterwards safely added to the liquid. Of course, the Na_2SO_4 does not interfere with the titration at all.

No. 2,219.—**Prescription Query** (J. C. C., Ont.).

"In the following mixture will you kindly tell me the cause of change in color:

℞ Morph. Sulph.	gr. 2
Tr. Cardam. Co	ʒ 4
Aquæ	ad ʒ 2

After standing for a day or two, it changes from the original red to a dirty brown."

You will find that the change takes place whether sulphate of morphine is present or not. The cause, therefore, is to be looked for in the water. The latter causes the gradual precipitation of the coloring matter of cochineal to which the tincture owes its fine color. The liquid finally retains only that coloring matter which is derived from the other ingredients. There is no help for this, unless the ingredients or proportion are changed by the prescriber.

No. 2,220.—**Renewing old Corks** (O. S. G.).

In general it may be declared a poor policy to use old corks over again. Certainly this should never be done, if they have passed through unknown hands, and bear the evidence of having been used in bottles of various, or at all events unknown or doubtful contents. Of course, we refer to corks intended for bottling liquids for internal use. Only under peculiarly favorable circumstances may it be safe to use such corks a second time, and even then not without having subjected them to a thorough cleansing. When corks are returned in the original bottles with which they have been sent out (and when there is no doubt about this), there will be no harm in using them again, if they are in good condition. At the dispensing counter, however, new corks should *always* be used, the risk of contaminating a mixture for internal use by a tainted cork being something that no pharmacist should venture to run.

For bottles containing liquids or solids that are not intended for internal use, second-hand corks *may* be used, provided there is nothing objectionable about them. It must, however, be a rather poor enterprise or business venture that has to have recourse to the expedient of using old corks for this purpose, there being several other uses to which old cork may be put and for which it is bought up by some dealers. Nevertheless, as this is an age where nothing is supposed to be wasted, and as there may be some more of our readers who can legitimately profit by the information here given, we will append a note on cleaning used corks.

Corks which have been used should first be sorted into: 1. Such as have retained their original color entirely or nearly so, and have evidently only been wetted with odorless or nearly tasteless liquids. These corks may usually be cleaned by one or more boiling in water. They are for this purpose best tied in a bag, made of loosely woven material which is kept below the surface of the boiling water either by weights or by wedges. 2. Such corks as have become stained, but not tainted either with a bad odor or taste. Here it will depend a good deal upon the nature of the stain. Corks which have been in ink bottles, for instance, will never be entirely restorable. They, and all similar ones, are preferably laid aside, each kind by itself, and treated separately, with a view of being used for the same purpose (and no other) again. Others are treated either by boiling water to which is added from 1 to 10 per cent of solution of chlorinated soda (Labarraque's solution), or, they may be cleaned by permanganate of potassium. The new National Formulary contains a process for bleaching sponge, which directs to immerse the previously cleaned sponge in a solution of permanganate of potassium, then to wash them with water, and afterwards to treat them with a solution of hyposulphite of sodium and some hydrochloric acid. While this is an excellent method for *sponge*, it will not do for corks. The permanganate of potassium is, indeed, the chief bleaching agent, but the hyposulphite of sodium likewise contributes to it, as it is decomposed by the hydrochloric acid into chloride of sodium, sulphurous acid, and free sulphur, a small portion of which latter remains imbedded in the texture of the sponge, where it certainly can do no harm. Free sulphur, however, might do harm in a cork, as it might affect the contents of the bottle in which it is inserted. For this reason. the hyposulphite of sodium must be omitted in the case of corks, and only the acid used after the permanganate. The corks should be put into the solution of permanganate (120 grains to the pint), so that they are below the surface of the solution, and allowed to remain therein for 1 or 2 days. They are then washed in water, and when they no longer stain the latter, immersed in a mixture of 1 volume of hydrochloric acid (commercial) and 8 volumes of water. About a pint of this dilute acid will be required for each pint of permanganate solution. Lastly, they are washed with water, until all trace of soluble matter is removed from them. 3. Such corks as are tainted by odoriferous matters or have acquired a peculiar taste not removable by the treatment previously mentioned. These are best thrown away, if no other economic use can be found for them.

No. 2,221.—**Blueing in Sugar** (New London).

This subscriber asks whether there is any granulated sugar in the market at the present time that does not contain any blue coloring matter, such as is added to neutralize the faint yellowish tint which sugar usually has.

In reply we would say that up to the time when the Sugar Trust went into operation, there were some manufacturers whose product was free from this impurity. Since that time we have met the same difficulty which our correspondent and many others have encountered, and we are still in search of a brand which can be called absolutely free from the objectionable ingredient. Meanwhile, we have recourse to rock candy for all special purposes, such as syrup of iodide of iron, etc.

No. 2,222.—**Zeihl's and Frankel's Solutions** (Boston).

Both, of these are used for staining tissues, in bacteriological examinations. They are prepared as follows:

Zeihl's Solution.

Fuchsine	1 part
Alcohol	10 parts
Solution of carbolic acid (5 per cent), enough to make	100 parts by weight.

Dissolve the fuchsine in the alcohol and very gradually and slowly add the solution of carbolic acid.

Frankel's Solution.

Water	30 parts
Alcohol	50 "
Nitric Acid	20 "
Methyl Blue	q. s.

Mix the water and alcohol, gradually add the nitric acid, allow the mixture to become cold, then saturate it with methyl blue.

No. 2,223.—**Modelling Wax** (E. D.).

A good composition for this purpose is said to be furnished by the following formula:

Beeswax	1 part
Lead Plaster	1 "
Rosin	1 "
Olive Oil	q. s.
Prepared Chalk	q s.

Melt the first three ingredients together, and incorporate a sufficient quantity of Prepared Chalk previously triturated with Olive Oil to a smooth paste, to impart to the mass the requisite stiffness. The Olive Oil may amount to 1 part or a little more. If desired, the mass may be tinted with a little carmine, or carmine and annatto, or other coloring material. Those here named will probably answer for dental purposes.

No. 2,224.—**Black Ink** (M. F. N.).

Your query for a formula for black ink "without boiling" is partly answered by the publication of some formulæ elsewhere in this number.

Another excellent formula which we have used for years is the following:

Nigrosine, best water-soluble	120 grains.
Gelatin, Cooper's	20 "
Bichromate Potassium	10 "
Glycerin	1 fl. oz.
Water	enough to make 10 fl. oz.

Dissolve the Gelatin in about 6 fl. oz. of water, add the Nigrosine and dissolve, if necessary, by warming. Then add the Glycerin, and lastly the balance of the water in which the Bichromate of Potassium has been dissolved. Keep the ink in a dark, amber-colored bottle.

No. 2,225.—**Geoffroya Inermis** (E. W.).

There is no standard formula for a tincture of *Geoffroya inermis* known to us from any existing pharmacopœia. But in accordance with the recommendation of the National Formulary, all tinctures for which no authoritative formula is otherwise provided should be made of such a strength that 1 pint of the finished tincture represents 2 troy ounces of drugs.

Geoffroya inermis Willd, is a synonym of *Andira inermis* Kunth, and is known by the name of Cabbage Tree. It is a native of Jamaica, and the bark has long had a reputation as a vermifuge. An allied species, *Andira retusa* Kunth, is a native of Surinam and Cayenne. To distinguish the two kinds, it is customary to call the former "Jamaica cabbage tree (bark)," and the latter "Surinam cabbage tree (bark)." Consult Stillé & Maisch's "National Dispensatory," 3d ed., page 202. U. S. Dispensatory, 15th ed., page 1593. You will, no doubt, be able to obtain it through one of the large wholesale houses of New York. If not, we would advise you to procure it directly from Jamaica.

No. 2,226.—**Saccharin and Alkaloids** (Dr. A. H. S.).

The proposition to combine bitter alkaloids with saccharin, we believe, was originally made by Dr. Fahlberg, who claims the discovery of saccharin, and obtained the patents on it. The firm manufacturing saccharin, prepares several of these compounds, viz.:

1. *Saccharinate of Quinine* (called by Fahlberg "Saccharin-Chinin"). This contains 36 per cent of saccharin and 64 per cent of quinine. It is a white powder of faintly-bitter taste, which may be completely covered by a further addition of saccharin. It is difficultly soluble in cold or hot water, and is best employed in form of powder.

2. *Saccharinate of Morphine* contains 39.1 per cent of saccharin and 60.4 (according to Fischer; should probably be 60.9) per cent of morphine.

3. *Saccharinate of Strychnine* contains 35.4 per cent of saccharin and 64.6 per cent of strychnine.

Incidentally we would say that we do not see the utility of the two last-named compounds. Indeed, we consider them as positively objectionable and dangerous. There will no longer be any chance of readily distinguishing the several alkaloids from each other by the taste, and a mistake may easily be made. We would at least advise that they be colored, so as to distinguish them both from the original saccharin, as well from each other.

A *saccharinate of cocaine* has been prepared by Mr. B. F. Hays of this city, and has been used to some extent.

No. 2,227.—**Rapid Estimation of Lead** (Croton).

The correspondent has a connection with the main water supply by means of a long lead-pipe, and wishes to know how he may make a rapid estimation, day by day, of the quantity of lead which the water may take up.

In the first place, we must remark that unless the conduit is very long, or the water has been allowed to remain undisturbed in the pipe in the intervals between making the tests (at least 12 hours), it will not be possible to detect the presence of lead, under ordinary conditions, unless the water drawn from the pipe for the purpose of analysis is concentrated to a small bulk by heat. However, assuming that the water, as drawn, contains enough lead to respond at once to tests, we would suggest the following method, based upon that recently proposed by L. Liebermann, as a modification of one previously used by Pelouze and Bischof.

Take two beakers of equal size, put into one of them 200 C.c. of the water to be tested, together with 10 C.c. of moderately dilute hydrochloric acid (1 to 3 of water), and 20 C.c. of saturated solution of hydrosulphuric acid. If the color of the mixture should become very dark, it is necessary to use a smaller proportion of the water to be examined and to complete the whole bulk of 230 C.c. by means of distilled water. Not more than a brownish coloration, insufficient to render the liquid opaque, should be produced; otherwise a smaller quantity of the water must be used for the assay.

In a second beaker are put 200 C.c. of distilled water, 10 C.c. of the previously specified hydrochloric acid, and 20 C.c. of solution of hydrosulphuric acid, and then—both beakers standing upon white paper—a solution of acetate lead, containing 1 Gm. in 1 liter, is allowed to flow, drop by drop, from a burette into the second beaker, until, after stirring, the depth of tint in both beakers is identical. The amount of lead solution consumed will give, by a simple calculation, the approximate quantity present in the suspected sample.

Of course, this method is liable to lead to error. But it has been shown that, when carefully conducted and when the tint produced is pale, the results are in satisfactory accordance with the actual quantities of lead present.

No. 2,228.—**Boonekamp Bitters** (J. N.).

The following formula (recalculated by us to U. S. weights and measures) is published by Hell. Others have been given by other authors.

Oil of Angelica	16 min.
" Bitter Orange	16 "
" Staranise	16 "
" Lemon	12 "
" Coriander	12 "
" Galanga	8 "
" Marjoram	8 "
" Absinth	8 "
" Peppermint	6 "
White Agaric	300 grains.
Liquorice Root, ground	2½ Troy oz.
Sugar	4 " "
Water	5 quarts.
Alcohol	enough to make 10 quarts.

Macerate the White Agaric during one week with 20 fluid ounces of Alcohol, and filter. Dissolve the Oils in the filtrate. Extract the Liquorice Root by infusing it with 1 quart of boiling water. Then add to this the Sugar and 4 more pints of water; afterwards the alcoholic solution first prepared, and then 3¾ pints more of alcohol. Filter, and pass enough dilute alcohol through the filter to obtain 10 quarts of filtrate.

We have given the ingredients according to Hell, and the directions according to our files. But we fail to see where the specific benefits of the product come in, so far as its medicinal properties are concerned.

No. 2,229.—**Tests for Antipyrin and Antifebrin** (M. O. A.).

In preceding numbers of this journal you will find a number of proposed tests for both of the above substances. In a recent issue of the *Chem. News* (Aug. 3d), Mr. David Lindo publishes some further contribution to this subject, as follows:

Knorr, who "appears to have discovered" [this should certainly read, "who discovered"] antipyrin, gives reactions by which it can be identified: 1. Even a highly di-

lute solution of the substance in water gives a red color on addition of a drop of ferric chloride solution. 2. The solution of antipyrin is mixed with a dilute solution of a nitrite, and a few drops of dilute sulphuric acid are then added. If the quantity of antipyrin is not too small, a blue color is developed; otherwise the tint will be green. Knorr also found that nitro-antipyrin is obtained by gently heating a solution of antipyrin in concentrated nitric acid. This crystallizes in white needles, is insoluble in water and alkalies, but is sparingly soluble in strong nitric or hydrochloric acids. Mr. Lindo wonders whether he overlooked a fine color reaction, which may be obtained by heating antipyrin with strong nitric acid in a small porcelain basin over the lamp until reaction commences; the lamp is then withdrawn, and when the reaction ceases, a fine purple colored liquid residue remains. On adding water and filtering, a beautiful purple-red filtrate is obtained, and a violet-colored precipitate remains on the filter. This reaction is very delicate, and has not been mentioned here tofore.

Regarding antifebrin, Mr. Lindo writes: I have met with no published tests [meaning evidently "color-tests"] for this body, and the only one I have discovered as yet must be applied to the solid substance, of which a very minute quantity, however, will suffice. The test depends upon the fact that when antifebrin is strongly heated with concentrated sulphuric acid, sulphanilic acid is formed, or at least a body which reacts exactly like it with nitrous acid and phenols. A small quantity of antifebrin is put in a porcelain dish, a little pure sulphuric acid added, and heat applied with a naked flame until the acid fumes strongly. When cold, a little water is added, and then a highly dilute solution of a nitrite. Next the mixture is treated with a phenol, such as alphanaphthol, thymol, or carbolic acid, when the characteristic red color (see this number, page 172) will make its appearance.

No. 2,230.—**Nitrite of Cobalt** (Several Inquirers).

The "nitrite of cobalt" which has recently been introduced in medicine as a definite agent for administering nitrous acid, is the double nitrite of cobalt and potassium, which was originally discovered by Fischer, and is obtained as a yellow precipitate when the solution of a cobalt (cobaltous) salt, acidified with acetic acid, is mixed with a solution of nitrite of potassium. The reaction is as follows:

$$\underset{\text{cobaltous chloride}}{2CoCl_2} + \underset{\text{potassium nitrite}}{12KNO_2} + \underset{\text{acetic acid}}{2HC_2H_3O_2} + \underset{\text{water}}{H_2O} =$$

$$= \underset{\text{potassium-cobaltic nitrite}}{(KNO_2)_6.Co_2O(NO_2)_4.H_2O} + \underset{\text{potassium chloride}}{4KCl} + \underset{\text{potassium acetate}}{2KC_2H_3O_2} +$$

$$+ \underset{\text{nitric oxide}}{2NO}$$

Roscoe and Schorlemmer (I., 134) give a reaction, in which 4 molecules of free nitrous acid are made to enter, besides 10 molecules of nitrite of potassium. We do not see how this agrees with the facts. The above reaction is frequently used as a test for cobalt. For this purpose the solution containing a cobalt salt is evaporated to a small bulk, then caustic soda added, and the precipitate redissolved with an excess of acetic acid. A solution of potassium nitrite is then added, the whole digested for a while at a gentle heat, and then set aside for 24 hours, when the yellow precipitate of the above-mentioned double salt will separate. As this is somewhat soluble in water, it is best washed with a solution of potassium acetate (containing a slight excess of acetic acid) and lastly with 80% alcohol. This compound is also known as "cobalt yellow," and consists, when viewed under the microscope, of minute crystals. According to Sadtler, the salt is usually anhydrous; but it may be obtained with from 1 to 4 molecules of water, according to the concentration of the solution.

No. 2,231.—**Baking Powders** (Subscriber).

This correspondent sends us the names of four baking powders, asking us to give their composition. Two of them are, however, entirely unknown to us, and on inquiry we cannot find that they are known or sold in the New York market. The other two are well known. As they happen to be among those reported on in a paper read at the last meeting of the Kansas Pharmaceutical Association, it may be of interest to place the whole series here. The analysis of these powders was made by Miss Rice at the laboratory of the University of Kansas, under the supervision of Prof. E. H. S. Bailey.*

We have arranged the results obtained by Miss Rice in form of a table to save space. The starch was in no case specially determined, but the sum of all the other solid ingredients deducted from 100, was put down as "starch." The "gas" is understood to mean the total amount, by weight, of carbonic acid gas, which 100 parts of the powder would give off, when treated with water. The solids were determined by igniting a known weight of the powder until all carbonaceous matter was destroyed. From this was deducted the amount of cream of tartar and of bicarbonate of sodium previously determined. The remainder was calculated to Rochelle salt, or tartrate of potassium and sodium [which need not therefore be assumed to have been originally present], or to the alum and sodium compounds, etc., formed. Regarding other details, we must refer the reader to the original paper.

Constituents of Baking Powders.	Royal Baking Powder.	Price's Baking Powder.	Leis' German Powder.	Jersey Powder.	Delmonico Powder.	Columbia Powder.	Banner Powder.
Bicarbonate of sodium...	24.70	21.17	20.31	18.82	16.38	18.97	13.42
Cream of tartar...	55.32	55.86	31.00	....	....	....	....
Tartaric acid...	....	....	15.27	....	....	....	....
Bitartrate of sodium...	....	....	7.85	....	....	....	....
Carbonate of ammonium..	1.52	....	....	....	....	....	....
Rochelle salt...	....	8.34	....	....	....	....	....
Ammonia alum...	....	....	....	34.15	30.07	35.71	24.06
Hydrate of aluminium, sulphate of sodium, of ammonium, etc.	....	....	....	1.05	16.55	....	1.28
Starch...	18.46	14.63	25.57	45.98	37.00	45.32	61.24
Gas...	13.62	11.09	10.64	9.86	8.58	9.94	7.03

No. 2,232.—**Sulphide of Calcium** (Montana).

The U. S. Ph. of 1880, on page 62, will give you part of the information you ask for. You speak of the work as if you were quite familiar with it, yet you do not seem to have found this preparation in it. The fact is, it is not pure sulphide of calcium, though commonly so named. It is a mixture of sulphide and sulphate of calcium containing generally accidental impurities derived from the ingredients from which it is prepared. It has long been used by the homœopaths under the name of *hepar sulphuris calcareum*, and was directed by Hahnemann to be prepared by mixing equal parts of finely powdered oyster shells and "pure" sublimed sulphur, then raising the mixture to a white heat, and keeping the product in well-closed bottles. It is, however, largely prepared by other processes, particularly one of the following:

1. Introduce into a clay crucible an intimate mixture of 4 parts of plaster of Paris (calcined sulphate of calcium) and 1 part of wood charcoal in powder. Heat the mixture to a red heat and further to nearly a white heat. Allow to cool, and preserve the product in well-closed bottles.

2. From 8 parts of plaster of Paris, 2 parts of powdered wood charcoal, 1 part of rye flour, and a sufficient quantity of water, prepare suitable cylinders. Dry them thoroughly and pile them alternately with a layer of charcoal in a muffle-oven, where the whole is afterwards brought to a full heat. When the charcoal is consumed, close the oven and allow to cool. Reduce the cylinders (freed from ash) to powder.

3. Make an intimate mixture of equal parts of powdered caustic lime and sulphur, press it firmly into a crucible, cover this well, and heat this during one hour so that the heating proceeds from above downwards. When cold, transfer the product at once to bottles.

The reaction is chiefly the following:

$$\underset{\text{lime (calcium hydroxide)}}{4Ca(OH)_2} + \underset{\text{sulphur}}{4S} = \underset{\text{calcium sulphide}}{3CaS} + \underset{\text{calcium sulphate}}{CaSO_4} +$$

$$+ \underset{\text{water}}{4H_2O}$$

No. 2,233.—**Bromidia** (B. & S.).

The proprietors of the preparation "Bromidia" publish a formula, in which they claim that each fluid drachm contains "15 grains each of pure chloral hydrate, and 'purified' bromide of potassium, and ¼ grain each of genuine imported extract of Cannabis Indica and Hyoscyamus."

Any attempt to get the extract of cannabis indica in *solution* in an aqueous menstruum corresponding to that which is present in bromidia, is unsuccessful. Nor does the extract yield to the menstruum any constituent that can be traced. In the case of extract of hyoscyamus, most of the active principle will probably pass into solution. There is no doubt in our mind or that of others who have examined the subject that the finished preparation contains no cannabis indica at all, though this may have been employed as an ingredient. The National Formulary has adopted a formula in which the extract of cannabis indica is retained. But it is made diffusible by means of tincture of Quillaja, and attention is drawn, in a note, to the fact that, if the mixture is filtered, the resin (extract of cannabis indica) will remain on the filter.

The formula for Tasteless Tincture of Iron you will also find in the New National Formulary, which you ought to procure as soon as possible. You may obtain it through the book trade.

Formula Asked For.

Schiffman's Asthma Cure. What is the composition?

* From Proceedings of the Ninth Annual Meeting of the Kansas Pharm. Association, held at Abilene, May 16th-17th, 1888. 8vo, Lawrence, 1888, pp. 67-73.